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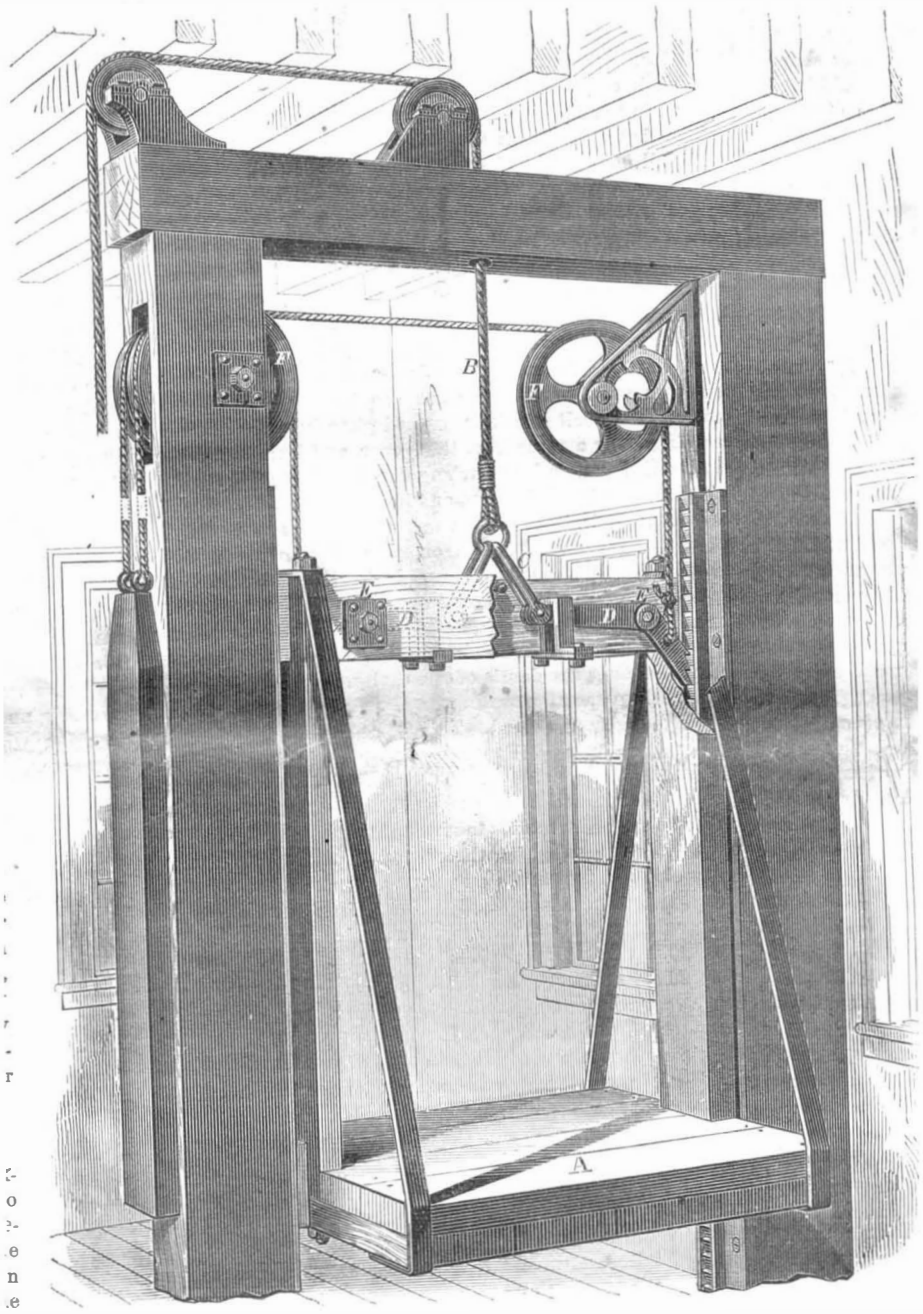
Improvement in Safety Hoisting Apparatus.

The use of cams and levers and of springs and levers for preventing the fall of the cage of a hoist, on the breaking of the hoisting rope, is not new; but, unfortunately, neither cams nor springs are wholly reliable, the latter, especially, are unreliable transmitters of power, losing elasticity when kept long compressed, and breaking when subjected to sudden strain. The object of the improvement, of which the accompanying engraving is an illustration, is to provide a certain means for preventing the fall of the cage in consequence of accident to the hoisting rope or chain. In this device the operation of the arresting levers is assured, as they are engaged with the rack instantly, in case of the breakage of the hoisting rope, by means of a counterbalance or weight, which, when the cage or platform is ascending, is moving in a contrary direction, thus giving the additional advantage of reducing the weight of the cage. Whenever the hoisting rope or chain ceases to act, the counterbalance rope comes into action and prevents disaster.

In the engraving, A, is the hoisting cage or platform, B, the lifting chain, attached by means of links, C, to the bell crank levers, D, having their fulcrums at E, and provided at their outer ends with teeth cut to fit the racks in the uprights of the framing. The ropes suspending the counterbalance weights are attached to the levers, D, at points outside their fulcrums, and pass over grooved pulleys, F.

The operation of the machine and its arrangements is apparent from an examination of the illustration. So long as the hoisting rope is held "taut," the levers, to which it is attached, are drawn away from the racks, and the machine operates freely; but the instant the hoisting rope breaks, or is slackened suddenly from any cause, the weight of the cage and its load comes upon the counterbalance ropes, the levers instantly engage with the racks, and the descent of the cage is prevented. There is no possibility of the device getting out of order, and ceasing to operate, except by the breaking of both the levers or one of the ropes; and the former may be made of the toughest wrought iron, and the latter may be wire ropes. A large machine is in operation at the works of Merrick & Sons, Philadelphia, Pa., and a working model may be seen at their office, 62 Broadway, New York city. Further information may be obtained by addressing the patentees at either place.



MERRICK & SONS' PATENT SAFETY HOISTING APPARATUS.

THE PARKHEAD FORGE.

The Parkhead Forge, Glasgow, is an extensive establishment, giving employment to seven hundred men and boys, but in consequence of the heavy nature of the work, the proportion of boys to men is smaller than in other branches of iron manufacture. The buildings cover several acres of ground, and are built in a most substantial style. On approaching the entrance to the Forge, the visitor is startled by the vibration of the ground under his feet, caused by the incessant blows of the steam hammers; and a peep inside reveals a scene of extraordinary activity. We shall briefly describe what came under our observation as we were shown through the work by one of the proprietors, and thus endeavor to convey some idea of what goes on in the place. The first department we entered was the rolling-mill, which is three hundred feet in length, and one hundred and fifty feet in breadth. At one end of the mill are arranged twenty-two puddling furnaces, and half a dozen reheating furnaces. The rolling and other machines are driven by a pair of horizontal engines of three hundred horse-power. The fly-wheel of the engines is eighteen tuns in weight, and it makes one hundred revolutions in a minute. The steam is supplied by fourteen vertical boilers, heated from the puddling furnaces. The iron is first rolled into bars, then cut up, re-heated, and either rolled into ship and boiler plates or wrought into pieces suitable for the forge. At one time the firm devoted attention to the making of armor plates, and their specimens stood the test of competition with those of English makers most creditably; and but for the want of convenience for carrying the plates—the nearest railway being a mile distant—Messrs. Rigby and Beardmore would have obtained a fair share of patronage from our own and other governments. The machines are capable of producing plates eight inches thick, and some of the plates made of that thickness have weighed twelve tuns each. At some of the puddling furnaces a new invention was being tested, and we were told that the most satisfactory results were being produced by it. Its object is to hasten and render more perfect the puddling process, by injecting a current of air at high pressure into the furnace. This is done by making the puddling bar hollow, and affixing to the outer end of it an india-rubber tube communicating with a powerful air pump. The patentee is Mr. Richardson, of Glasgow; and the advantages gained by the contrivance are that a charge of the furnace can be puddled in fifteen minutes less than the time required by the usual process, and that the iron produced is purer and tougher.

The forge or smithy is nearly as large as the rolling-mill, and its fittings are of the most gigantic kind. There are two steam cranes, capable of lifting fifty tuns each; four, forty tuns each; and four, twelve tuns each; and these are so arranged that a shaft or other piece of work may be passed from one to the other all over the shop. There are fifteen steam hammers, varying in weight, from seven tuns to two. Finished shafts—that is, finished so far as the hammering was concerned—were lying about in all directions, and so delicately had these been operated upon by the hammers that the surfaces were so smooth that turning would seem to be almost superfluous. Yet they were destined before leaving the place to be fitted into a lathe and turned with the greatest exactness. In the heating furnaces, and under the hammers, were a dozen more heavy jobs in the shape of crank shafts, rudder frames, and such like; and as these were in all stages of progress, a glance at them made plain the whole process of forging. In making a crank shaft, for instance, a piece of iron, eight feet or ten feet long, and of suitable diameter, is used as a "haft" or handle. At one extremity it is fitted with cross bars or levers, by which it may be turned on its axis; and the other end is shaped conveniently for having smaller pieces of iron welded to it. The welding end is placed in a furnace, and in about an hour and a half raised to a welding heat. The crane by which the iron is moved about is fitted with a chain collar or sling, in the loop of which the iron rests. The collar works in a pulley attached to the chain of the crane, and moves easily, so that the shaft may be readily turned on the anvil. When the proper degree of heat is attained, the stopping of the furnace is removed, the steam crane put in motion, and the gigantic bolt is swung on to the anvil of the steam hammer. Several large slabs of iron, similarly heated in another furnace, are then brought out and laid on the "face" of the "haft." A signal from the head forgeman, and the hammer drops upon the glowing mass, and a dazzling shower of sparks fly off in all directions. Again and again the hammer descends, the iron meantime being carefully moved about, so as to have the whole wrought into a homogeneous mass. Gradually the iron assumes a dull color, but not before the desired end is obtained. It then goes back to the furnace, comes forth glowing, has another addition made to its bulk; and so on. The most difficult part of the work is the formation of the crank-piece, which is forged solid, and forms a huge square projection on one side of the shaft. When the shaft has acquired the proper dimensions it is allowed to cool, and the haft-piece is cut off to be used again. As the shafts are turned down until a good surface is obtained, an extra inch or so is allowed in the forging. The heaviest work on hand, at the time of our visit, were the shafts for two iron-clad rams which are being built by Messrs. R. Napier & Sons for the British Government. These shafts were upwards of fourteen inches in diameter. All shafts are made in lengths of about twenty feet, and these are made with flanged ends so that they may be firmly united.

For dressing and finishing such huge pieces of iron as we have described, special and costly appliances are necessary. These are located in the machine shop, an apartment one hundred and fifty feet in length and fifty feet in breadth, both sides of which are lined with turning lathes, slotting and boring machines, and such like, of extraordinary size. One of the turning lathes is said to be the largest in the world; and some idea of its dimensions and form may be obtained from the fact that the crank shaft of the *Monarch*, though weighing thirty-two tuns, was turned in it without taxing its capabilities to the utmost. Some of the iron shavings lying about the vast machine were fully one inch broad and one eighth inch thick; yet these were turned off with apparently as little effort as if the material had been wood instead of iron. One of the boring machines is sufficiently powerful to drill a hole ten inches in diameter through a solid block of iron; and the largest slotting machine can send off chips a pound or two in weight. When the work leaves this department, it is generally quite ready for being fitted into its place. This firm pay nearly £40,000 a year in wages; and in all departments of the establishment, 15,000 tuns of iron, and 60,000 tuns of coal are annually used.—*The Ironmonger.*

THE LIFE OF IRON BRIDGES.

The Engineer says: "It may be assumed that a wrought iron girder bridge, subjected at intervals to a dynamical load not exceeding the fourth part of its powers of ultimate resistance, will be safe for traffic for a period of 328 years. This assumption is based upon the proviso, that the successive alternations of strain and repose should not be repeated more than 100 times during the same day. With the exception of some country lines and rural branch railways, the number of trains of every description passing over bridges in twenty four hours, considerably surpasses the limited number one hundred. Taking the traffic during the night to be only one third of that during the day, we may conclude that, as a low average, 200 trains pass daily over the majority of our metropolitan and suburban railway bridges, and as a maximum, the hardest worked member of the bridge tribe possibly undergoes as many as 300 alternate changes of active and passive conditions from sunrise to sunset. Adapting this calculation to our theory, we may estimate the life of the hardest worked railway girder to extend over a period, in round numbers, of 100 years, under ordinary circumstances.

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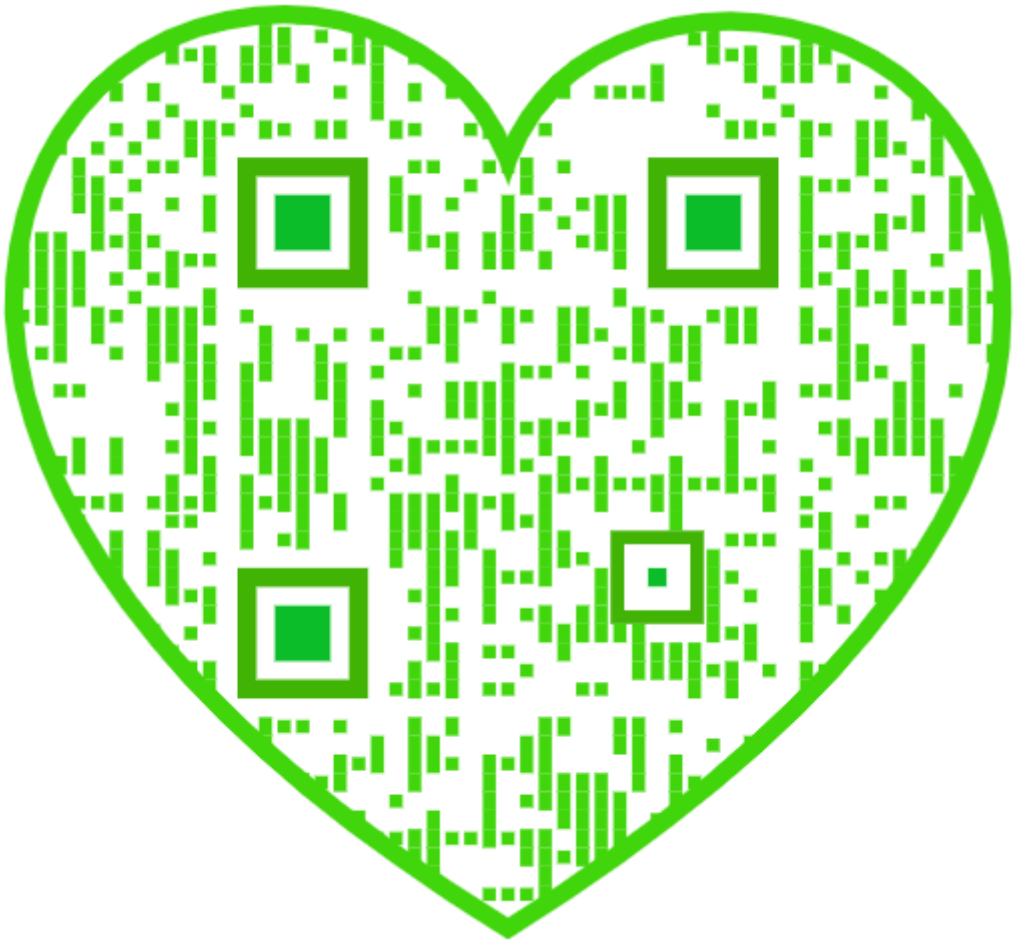

"Similarly to all theories, conditions are here supposed to exist, which, in numerous instances, are probably wanting. In the experiments upon a wrought iron beam, from which these results have been deduced, the dynamical load was accurately proportioned to the ultimate power of resistance; but there is no question, that in some of the earlier built iron girders no such proportion obtains. Certainly the majority of wrought iron girders are in excess, so far as their strength is concerned, of the quarter ratio between their working and breaking load; but, if we may judge from failures that have taken place, some are comparatively weaker than they ought to be. Unfortunately, in these experiments, with the exception of those confined cast iron bars, in which the load applied was of a static and not dynamical character, the element time does not enter into the calculation, and the inevitable deterioration it produces upon everything exposed to its influence, is altogether disregarded. It is one thing to rivet up a beam, and then subject it immediately in the plentitude of its strength to so many alterations of state, before the corroding action of wind and weather has the least chance of exerting its destructive power; but it is a very different affair to allow a beam, which is yearly becoming weaker, to be submitted to the passage of heavy rolling weight. In the one case the strength of the girder, so far as extraneous causes are concerned, is constant; in the other it is variable.

"A difference will obviously present itself respecting the ultimate durability of cast and wrought iron girders individually. When the former fail they fail completely; there is no repairing a fractured cast iron beam, whatever shape it may possess; it is only fit for the cupola or the puddling furnace. The same circumstances do not attend the dissolution of wrought iron girders provided they are well watched and the 'first symptoms' attended to. The Menai Bridge, for example, might be replaced piecemeal, accordingly as every plate, angle iron, or other portion of it becomes deteriorated to an extent sufficient to imperil the safety of the structure. In this sense a wrought iron bridge is practically indestructible, since it admits of any and every degree of partial repair, and after the lapse of its first hundred years of life, may be completely rejuvenated and commence a fresh career. Lattice bridges—those constructed upon the open web system—in general afford special facilities for this process of gradual reconstruction, since a bar can be taken out and replaced without in any manner jeopardizing the safety of the remainder. The external effects, or visible appearance of the influence of time, must not be confounded with that invisible and inexplicable action that is incessantly in progress in connection with the molecular composition of the material. For similar reasons that the wrought iron girder, as a structure, can be preserved by successive reparation from the results of visible corrosion and decay, so is it also independent, in some degree, of any atomic alteration, unless we imagine the whole girder to be equally affected, and to fracture precipitately like one of cast iron. It has always been a puzzle to engineers to satisfactorily account for the sudden fracture of cast iron, whether in the form of girders, axles, or engine beams, under a much smaller strain, than what they had previously borne with impunity for a long period of time. A ready and apparent, though by no means necessarily a true, explanation of the fact is that it is owing to 'a change having taken place in the internal structure of the material.' This is equivalent to the specious and clever manner in which members of the faculty extricate themselves from their professional dilemmas by ascribing the fatal termination of any unknown complaint to 'disease of the heart.' The experiments made by Mr. Fairbairn upon cast iron bars, although interesting and valuable so far as a mere static load is regarded, present no analogy to the case of a cast iron bridge undergoing the transit of some couple of hundred trains per diem. Whatever the exact nature of the change may be, or the rate at which it progresses, until the cohesive power of the material is injured, it is impossible to assert; but we are nevertheless certain that the continual repetition of severe strains on a girder, must ultimately impair its powers of resistance. In a word, then, upon this hypothesis, every cast iron girder is doomed to break at some time or another, and what is worst, break suddenly, the precipitation of the passing load into the gulf beneath being the first sign of danger. This is not a very consoling reflection to a people who travel so much by rail as ourselves; but immunity from accident begets indifference, and although the contingency is possible, yet it is of an occurrence so rare that it is out of the sphere of probabilities.

"One is apt to regard the breaking down of a railway bridge in the light of a possible, but very remote contingency; to believe in such an occurrence in a vague, uncertain manner as an event that might or perhaps would take place 'some day,' but which, at present, is not worth thinking about. There is a little of the Mahometan doctrine of fatalism in all this, and although we do not exactly sit down, fold our hands, and cry 'Bishmillah,' as the sole preparation and defence against a coming danger, yet we require it to be brought pretty well home to us before we are thoroughly aroused to action. From the experiments we have quoted, it was ascertained that the strength of cast iron to resist repeated alterations of strain was much greater than what has usually been accorded to it. At the same time we have no data upon which to base the life of a cast iron girder, unless we assume it to be equal to that of a wrought iron one. It has already been shown that the facilities offered by structures of the latter description, for gradual repair and actual reconstruction, leave no cause for anxiety on their behalf. We are in possession of the true elixir vitæ as regards them, and all that is required is to watch the time for making use of it. On the other hand, the 'first symptoms' of approaching rupture in the case of a cast iron girder cannot be perceived, and it is questionable whether the most careful and minute 'surveillance' which can be exercised over every cast iron bridge upon a line, would be able to detect the 'internal change of structure,'—that invisible dissolution which precedes the visible downfall. Taking for granted, therefore, that the natural life of a cast iron railway bridge is, for a minimum, one hundred years, some of our oldest examples have about sixty years to run, supposing that they die literally of old age, and their demise is not accelerated by accidental injury."

THE SHOEBURYNESS EXPERIMENTS.

During the months of June and July, a series of experiments in artillery practice have been made at Shoeburyness, England, to test the modern improved artillery, and its effect upon iron plating. The tests were of the most severe character, the plates being of a great thickness and of a superior quality of iron. One of the targets had a porthole in its center, and its condition at the end of the experiments, as illustrated in the English journals, gives evidence of the enormous efficiency of the guns used in the experiments. The most formidable shot at this target was from a 10-inch gun, at a range of 1000 yards. The effect of this shot was to carry away, for a considerable area, the whole of the plating above and to the left of the port-hole, driving with it masses of iron, converted by the projectile into missiles more deadly than the shot they were designed to resist. We have waited for the conclusion of these important experiments, which have extended through a much longer period than was at first anticipated, that we might lay their results before our readers. We shall only refer to the most important of them, as described in the *Mechanics' Magazine.*

The first experiment we shall notice was a 12-inch shell, with full charge, aimed at the upper part of an extra plate, placed on the front of the shield, and which it broke into several pieces. It penetrated 16 inches, and exploded backward, doing no damage at the rear of the shield, beyond fracturing another horizontal plank. The Rodman gun, with a full charge, was then brought to bear on the upper part of the shield. It struck the curved plate at the left hand top corner, a portion of which was already knocked off, and it broke in two, doing no further damage. A shell from the 12-inch gun was fired with a charge equivalent to 1,000 yards range. The shell struck the second plate from the left hand, carrying away a piece from the corner, and bursting; the explosion lifting up a large triangular fragment of the adjoining plate previously broken, and hurling it on the roof of the building. This mass of iron was about 6 feet base by 5 feet sides, and remained pivoted on one of the large roof bolts, which held it without breaking. Inside the casemate at the rear, the ironwork in connection with the roof was much distorted, and a great cavity, admitting daylight, was formed through the plates, the head and point of the shot remaining jammed among the debris of the cavity.

The firing was afterward directed against the granite base on which the target stood. This forms a plinth about 4 feet high, projecting about as much from the surface of the shield, the step being rounded off. The shot—a 450-pounder, from the Rodman gun, with full powder charge—struck the granite toward the right hand, plowing a furrow some 5 feet wide and 3 feet deep, smashing the granite to powder, and scattering a cloud of fragments and dust around. After this shot, two rounds were fired at Sir John Brown's solid rolled 15-inch plate, which merely stood against some iron standards and a few balks of timber. This target had already had three rounds fired at it, with a result highly creditable to the plate, considering the conditions under which it was tested. The first was a 12-inch shell, with 76 pounds of powder, and which struck the shell about 2 feet from the end, which it broke off and hurled about 6 feet to the rear. The second shot, which was from the Rodman gun, with full powder charge, struck the plate near the center of the original length, and close to where it was hit by the two shots of the previous day. The plate at this point was already severely cracked, and the result of the last shot was to complete its destruction, the plate separating into four pieces. The fractures showed a splendid quality of iron, although here and there symptoms of bad welding were visible, and this was all the most adverse criticism could pronounce against it. In its favor there was everything to be said. Considering its unsupported position, and the widely different conditions under which it was fired at to those of a fort where it would be fixed as a defence, it stands out at once as a great success. Although the Plymouth fort stood a good amount of battering, it is to be remembered that it has been improved upon by replacing some of the bars by plates. These were just the points that withstood the firing the best, and this strengthens the conclusion that a mighty strength of resistance would result from the use of a single solid plate, instead of a compound laminated plating.

This was the conclusion of the third day's experiments, and at this point we may pause to notice the recorded details of the practice, as regards the force and velocities of the shots fired, and which are as follows: The Woolwich 12-inch rifled 600-pounder, with 76 pounds of pellet powder, 5,588 foot-tuns, 1,159 feet per second velocity. The 10 inch rifled 400-pounder, with 60 pounds 1 gr. powder, 4,431 foot-tuns, 1,264 feet velocity. The 15-inch smooth-bore Rodman, with 50 pounds English powder, equal to 60 pounds American, 4,215 foot-tuns, 1,161 feet striking velocity. In the same gun, with 83¼ pounds charge—equal to 100 pounds American powder—the velocity was above 1,400 feet, and the total energy about 4,000 foot-tuns.

The "War Office Casemate," was next made the object of attack. This casemate was manufactured at the Millwall Iron Company's works, and was designed with the view of testing the resistance offered by a given weight of iron plate, disposed in various thicknesses and positions. It is divided into six sections, each one of which represents a different system. The first section consists of an 8-inch solid plate, placed direct upon the 2-inch skin, which is common to all the series. The second is of 4½-inch plate upon a backing 7 inches deep, formed of channel-iron placed back to back. The third is a 6-inch plate, with backing 7 inches deep of Hughes' hollow stringers. The fourth is a 4-inch plate, with 7 inch backing of channel-iron; the fifth is a 4½ inch plate resting partly upon 7-inch backing of channel-iron, and partly, with only the interstices between itself and the inner 2-inch skin, filled upwith 7 inches of concrete, forming the sixth section. The structure was roofed in with brick arches and concrete, as in ordinary casemates. The firing was from the 7-inch, 9-inch, and 10-inch rifled guns, and the Rodman 15-inch smooth-bore gun, with battering charges, and at the same range as the Plymouth shield, viz., 200 yards. Only Palliser shells were used, these having established their superior penetrative power over the Palliser shot.

Twenty rounds were fired in all at this target, the first being a 7-inch shell, which struck the 8-inch plate, penetrating about 8½ inches, but doing no damage to the rear. The second round, a 7-inch shell, struck the 4½-inch plate supported by 7-inch channel-iron backing. It penetrated 14 inches into the target, but caused no damage to the rear. The third shell struck on the vertical junction of the last plate fired at, with the 6-inch plate backed by hollow stringers. The result was a penetration of 8¾ inches, the head of the shell remaining in the hole, and the rear remaining undamaged. The above three portions are marked A, B, and C, respectively, and they are backed with a massive tapering concrete pier. The fourth shell struck the last named section (C) where it has behind it 2 feet 6 inches of concrete, strengthened by iron girders. The penetration was 10½ inches, with half a dozen nuts stripped off in the rear. The fifth shell struck that portion of the target covered by 4-inch plates upon 7-inch channel iron. The plate buckled ¼ inch for about two feet around the shothole, and the total penetration was 13¼ inches, the head of the shell remaining in the hole. Seven more nuts in the rear were stripped off the bolts. The sixth shell struck the 4½ inch plate on concrete backing, penetrating 14 inches into the structure.

The practice now commenced with 9-inch shells, the first round striking section A of the target, penetrating 13 inches. The second shell struck the B section, penetrating 21¼ inches, the plate buckling considerably, and seven nuts twisted askew in the rear. The third shell struck on a bolt in section C, causing a buckle of ½ inch at the top edge of the plate, the penetration being 18¼ inches. The fourth shell struck the same section, penetrating 14½ inches, and clearing off five small nuts in the rear. The fifth shell hit on section D, the penetration being 9 feet 8 inches. At the rear the ⅝ inch iron skin mantlet was driven back 3 inches, and twenty small nut heads were stripped off. This portion was driven back by a bolt, and the mantlet skin was turned up also beside the port, the whole forming a considerable smash. The sixth round struck upon the E section, penetrating 22½ inches, and causing no damage in the rear. The 10-inch gun was then brought into play, the first shell from which struck the A section, buckling the plate, and penetrating 32 inches. The second round struck the B section, causing a buckle, and penetrating 4 feet 9½ inches. The shell was supposed to have burst in the concrete backing. One of the vertical channel irons lifted up a few inches through the concrete roof. The ⅝ inch skin at the back of the pier opened slightly at the joints. The third shell struck the section C, penetrating 6 feet, and passing into the concrete pier. At rear, the covering slip at the angle of the pier, ripped open over a length of 5 feet 8 inches, with ten rivets sheared, and a bulge of 5 inches in the ⅝-inch skin on the back of the pier.

The next shell struck the C section in another place, and completely penetrated the structure, clearing everything before it, the point of the shell being carried 200 feet to the rear. Some pieces of the ⅜-inch skin were thrown 20 feet away. The point struck was a weak one, being near a joint which was not covered by the backing. This points out the necessity of placing the stringers so that the joints of the plates should be supported by them, instead of having them at right angles to the line of the plates, as at present. The fifth round, with the 10-inch shell practice, struck the D section, making a clean penetration. One of the ⅜-inch mantlet plates in the rear was blown 20 feet away, and the timber screen was smashed up. There was an opening in the back of the target 4 feet in hight and of considerable width. The angle iron of a vertical girder on the left of the shot-hole was curved 3 inches out of the straight, a 2-inch bolt was broken off, and the concrete was blown out. The sixth and last 10-inch shell also struck upon the D section, and drove the whole side of the target back from its brick-work setting about half an inch. It penetrated 4 feet 11 inches, lodging in the concrete backing, and bulged the cover plate in the rear, stripping some more small nuts, and cracking the roof slightly all round. After this shot the Rodman gun was fired, a round shot striking the junction of the 6-inch plates above the port-hole. It caused an indent 7 inches deep, and sheared off a bolt head 6 inches from the face of the target. At the rear the angle iron supporting the ⅜-inch skin over the port beat three inches, thirty small screw nuts were knocked off, and the whole skin ⅜-inch plate, was knocked out a distance of 9 inches. One rivet was knocked out from the top of each port jamb. The second round from the Rodman gun struck the A section of the target, making an indent of 4¼ inches, but doing no further injury.

From the above the nature of the subsequent experiments may be sufficiently inferred, as well as their general results. *Engineering* says that the protective points of the Plymouth Breakwater Fort have been well tested in this trial, and found

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wanting, and nothing more conclusive is required to prove the fallacy of opposing to heavy ordnance a rigidly unyielding iron wall.

THE PACIFIC MILLS MANUFACTURING ESTABLISHMENT AT LAWRENCE, MASS.

IN connection with the French Exhibition of 1867, the Emperor Napoleon proposed ten awards of 10,000 francs each (nearly $2,000 in gold) to ten different individuals or associations, who, in a series of years, had succeeded in securing a state of harmony between employers and their workpeople, and most successfully advanced the material, intellectual, and moral welfare of the employés. In response to this appeal, the "Pacific Mills," at Lawrence, Mass, devoted to the manufacture of ladies' cotton and wool dress goods, prepared and forwarded to the jury a statement concerning the operations of their establishment. The jury awarded the third place on the list to the Pacific Mills, together with a prize and a gold medal.

We have before us the printed statement, which embodies many very interesting facts about the organization and management of this model establishment, some extracts from which will interest our readers.

THE ORGANIZATION.

The management is confided by about one hundred and fifty stockholders, to nine directors, chosen annually.

The original number of shares of the company was one thousand, costing $1,000 each, making a total capital of $1,000,000. The cost of the buildings and machinery having exceeded this sum, fifteen hundred shares more, at same cost, were issued, making the total number of shares to be twenty-five hundred, and the cost of the capital stock $2,500,000.

They commenced operations near the close of the year 1853, but no goods were ready for market until the spring of 1854. The amount of machinery then consisted of one thousand looms, with carding, spinning, and dressing machinery sufficient to supply them, together with combing machines and spinning for worsted yarn, used in the manufacture of mixed fabrics, and was equal to the production of about two hundred thousand yards weekly, of calicoes and mousseline delaines, with ten printing machines for preparing these goods for the market.

The buildings and machinery have since been increased, so that there are now in operation about one hundred thousand spindles for spinning cotton, with cleaning, picking, and carding machines to supply them, and about sixteen thousand spindles for worsted, with all the necessary preparing machines to occupy thirty-five hundred looms for weaving the two classes of goods above-named, and others, together with twenty-two printing machines, producing a weekly average of about seven hundred thousand yards. The machinery is propelled by eight turbine wheels, six of them being seventy-two inches in diameter, with a fall of water equal to twenty-six feet, yielding fifteen hundred horse-power.

The average sale of the manufactured goods of the company, for a few years past, has exceeded $7,500,000.

About thirty-six hundred work-people are now employed by the company; of these there are sixteen hundred and eighty men, fifteen hundred and ten women, eighty boys between ten and twelve years, one hundred and forty boys from twelve to eighteen years, forty girls from ten to twelve years, and one hundred and fifty girls from twelve to eighteen years.

In the origin of the establishment the principle was adopted by the managers that there was to be a mutual dependence between employers and employed, each having rights which the other should respect, and that inasmuch as the success of the proprietors must depend much upon the cheerful and intelligent co-operation of the work-people, certain plans were adopted to secure "the material, moral, and intellectual welfare of the workmen," both as a duty to them, and one of self-interest to the proprietor.

MATERIAL.

For the *material* well-being of the laborers, special care was used in the original construction of the work-rooms, to make them cheerful, comfortable, and well-ventilated, so as to avoid as far as possible, the unpleasant drudgery of work, and to secure order and neatness throughout.

Houses were constructed for dwellings, which should give to families residences at moderate cost of rent, that would secure the health and comfort of the work-people, while they were cheerful and attractive. Men pay for these houses a weekly rent about equal to one-eighth of their wages. Large buildings were erected for the use of single females whose residences were at a distance, and divided into seventeen large apartments, capable of accommodating eight hundred and twenty-five persons in the aggregate. The rooms are arranged for two persons each; well ventilated and lighted, and comfortably furnished. Unmarried men are never allowed to lodge in these houses, nor in any case a married man, excepting he is accompanied by his wife, and even then but rarely. Females pay about one-third of their average wages for rooms in these boarding-houses, including food, lights and washing. Fuel for fires in the rooms is an extra expense.

It is common to provide coal, and sometimes flour, for the work-people, at the cost price of large quantities.

Another effort for the *material* welfare of the operatives was adopted in the earliest history of the enterprise, and has been continued for nearly thirteen years, with marked success, doing much to promote "harmony among all those co-operating," and to establish a bond of sympathy and union.

An association was formed, called "Pacific Mills Relief Society," of which each person employed by the company *must* be a member, the entire management thereof being in the hands of the work people, each officer being chosen by themselves from their own number, excepting the president, which office has always been filled by the resident agent or manager, who seldom acts, however, excepting as counsellor or umpire.

Each person, on commencing service, elects whether he will pay two, four, or six cents per week to the relief fund—the lower sum being a little more than one-hundredth part of the weekly averages of those who are the youngest, and consequently least paid, and the highest sum, six cents weekly, bearing the same proportion to the average weekly wages of the entire body of work-people. When the sum in the hands of the treasurer of the society, who is always the confidential clerk of the company, and keeps the deposit with the company for protection, has reached the sum of $1,000, the weekly subscription of all persons who have been employed by the company three months ceases, while it continues with the new comers.

This condition of funds occurs so often that for nearly one-half the time the older employés are not assessed, and the real sum withdrawn from their wages annually is a very small proportion of their wages, and is far from being a burden to the poorest.

When a person has been in the employment of the company three months, and consequently for that time paid his elected sum to the funds of the relief society, he becomes a full member of that society, and entitled to certain privileges. If sickness occurs, preventing him from labor, and he sends notice to the overseer or head workman of his room, one of the appointed stewards is sent to learn the nature of the illness, and the sick one becomes the special charge of this steward, who for a man is one of his own sex, or if a female, a woman; and it is this steward's duty to see that a nurse and physician are secured, if necessary, and to draw from the wardrobe of the society such changes of personal and bed linen as the circumstances demand.

Each sick person, if the illness continues one week, is thenceforward granted an allowance from the funds of the society. He who has paid two cents per week for at least three months, receives $1 25 weekly for the period of twenty-six weeks, if sick so long. Double this sum is allowed if four cents have been paid; and $3 75 when the amount paid has been six cents weekly. In cases of special need the officers of the society are authorized to make an extra allowance, though great care is used in such a dispensation. Those who die poor have their funeral expenses paid, and are respectably buried in the beautiful lot in the city cemetery belonging to the society. In some cases the deceased has been sent to his native town, by the desire of his friends without cost to them if they were poor.

Sick members are often accompanied to their friends by a steward, or the overseer of their workroom, when too feeble to go alone, or the friends too poor to come for them. The blessings of this society are thus made known to parties at a distance, and it often induces persons of excellent character to seek employment of this company, while those who have secured the benefits of the relief society retain it in warm remembrance. More than one poor mother, whose only child, while a member of this society, has been disabled by sickness, has found the weekly allowance an invaluable aid to her slight income, and called loudly for blessings upon its officers and the institution engaged in such a work of merciful kindness. Many a father or mother, or other relative, whose child or friend has been sent to this company, have besought the blessings of heaven upon the members of this society who have cared for their absent ones in time of sickness, and soothed them as they have faded away from life.

Though there is not space for details of great interest, it must be seen that this plan has a direct tendency to promote sympathy for each other among the work-people, and to secure a bond of union. Most surely those who daily observe its workings see it.

It will also be noticed that a very important feature of this plan is that it is an association of the work-people themselves, wholly controlled by them, and consequently sure of permanency, while favored to its present extent by the employers. This is likely to continue, because they witness its important influences and usefulness.

The total amount of money expended for the benefit of sick members in twelve years of its existence, ending in April 1866, has been $25,530 68 to eighteen hundred and sixty-eight persons, and the amount paid to the fund has exceeded this sum about $1,200. The corporation contributes weekly to this fund, and also to meet individual cases which are especially aggravated.

MORAL.

To meet the protection of the large number of single females employed by the company, who, as is often the fact in the manufacturing establishments of the United States, and perhaps elsewhere, are away from the guardianship of their friends, the boarding-houses referred to above are controlled by persons carefully selected for their ability to influence this class of work-people, of established good character, who will take an interest to secure the comfort of their boarders, and save them from bad moral influences, acting really, as far as possible, in the place of guardians. If a young female is known to visit places of evening amusement of doubtful character, or gives any reason for suspicion that she is guilty of immorality, or even of careless unguarded conduct, she is admonished, and if reform is not immediate she is discharged from the house and from employment.

The doors of the house are locked at ten o'clock at night, and no one allowed to be out after that hour without a satisfactory excuse. Doubtless persons of immoral character secure employment by the company, and by superior secrecy retain their connection. Among so large a number some will be impure, but it is believed that very few of these females are led astray while connected with the mill, if virtuous when commencing work. It is impossible for an openly vile person to retain connection with the company.

Men of intemperate habits, or of general bad character, are excluded from the company's service, though patience with them is encouraged, with the hope of securing reform, and this forbearance and attendant labor has often been rewarded. It is an established principle that all profanity or other bad language, any bad example, or even abuse of authority among the head workmen, must be strictly avoided, especially when these overseers have in their charge females or young persons. More than one such responsible workman has been removed for using improper words, or ill-treating subordinates. It is absolutely demanded of these persons that they treat those under them as they would desire to be treated themselves if in their position.

The directors have placed their associate, the manager at the works, to represent their feelings to the work-people; to show them sympathy in their trials; to counsel them in their need of advice, and to be their *Friend*.

Careful efforts have been made by him to secure their confidence, and he has cultivated the conviction that they could ever find in him a father, a brother, or friend. Many hearts have been moved to earnest gratitude for the aid which they have thus secured in their time of need. It requires a vast amount of patient listening to complaints; to tales of sorrow and want; but it has had its reward in seeing so many relieved and made glad and hopeful. The real moral effect and the real satisfaction in such a relation between employer and employed cannot be written. The spirit of the employer is imparted to the more responsible and influential workmen, and to those under them, while a healthy moral condition is secured.

INTELLECTUAL.

When the company was first established, the directors appropriated $1,000 for the purchase of suitable books for a circulating library, and provided a suitable room for it on their premises. The work-people have always been required to pay one cent each week during their services, and they thus become members of the Pacific Mills Library Association, which is managed entirely by themselves, they choosing their own officers for the control of its affairs, and for the selection of books, but selecting one resident manager for the president and chairman of the library committee. This weekly payment secures the privilege of the use of the library and reading-rooms of the society. One room is appropriated to males, and is supplied with the local newspapers of the city, and of Boston and New York, together with numerous serials of a scientific and literary character, and is open from six o'clock A. M. till nine P. M., warmed and lighted. It is in close proximity to the other room containing the library, now exceeding four thousand volumes, and also a cheerful, airy, comfortable apartment for the females, which is carpeted, and made attractive by daily and weekly publications, specially adapted to their wants, and stereoscopes with numerous slides, all in charge of an intelligent and cultivated young lady. It is open from nine o'clock A. M. till nine o'clock P. M., and is much frequented and valued.

A large number of volumes of the library are in constant circulation, as the number of the work-people who cannot read or write does not exceed fifty in one thousand, and these are principally of foreign birth. All new publications adapted to this class of readers are bought as soon as published. The privilege of taking books from the library is extended to members of families whose head is a member of this association.

The funds of the society are also used to purchase tickets of admission to lectures, and suitable popular amusements, which are distributed among the members. This association, as well as the relief society, it will be seen, is supported and managed by the work-people themselves, who secure a valuable return for their small outlay, and also the permanency of its operations, avoiding the dependence for existence and usefulness upon the life or even connection of any one person of special prominence.

The law of the State forbids the employment of children under ten years of age, and requires that children employed between ten and twelve years of age shall be in school sixteen weeks of each year, and those between twelve and sixteen years, eleven weeks. The company contribute annually to the support of an evening-school for both sexes.

SUCCESS.

It has often been stated that care of employers for the education and welfare of their operatives, especially to the extent herein shown, is incompatible with pecuniary success. Facts prove that this is not true with the Pacific Mills, but others must determine how much of this is due to the principles of action established and maintained. It is also believed that the work-people have received great benefit. Some of the evidences of this are the following:

1. There have been no *strikes* among the work-people, which are their curse and the dread of employers. They have been encouraged to feel that any grievances will be patiently listened to, and frankly discussed, and the result has always been favorable to good order. By no means has every uneasy spirit been quieted, but the mass has been satisfied.

2. A higher class of workmen has been secured. Those best able to appreciate the privileges enjoyed in connection with this company have been drawn thither for employment. Specially is this true among the overseers who engage the laborers in their different departments, and give character to the mass. Their intelligence and hearty co-operation in the plans for the material, moral, and intellectual advancement of the operatives, mold the whole and secure a higher stand-

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ard. The general influence of the principles adopted by the company leads these prominent workmen to feel that they are intrusted with a degree of guardianship of those under them, and this feeling is very manifest. Respect for the manhood of a workman molds him.

3. Many of the work-people have invested their funds in *savings banks*, and this is specially encouraged. Formerly the company received deposits from the work-people, allowing an annual interest of six per cent., but for some prudential reasons this plan was abandoned, and the depositors were encouraged to invest in chartered banks. The company held in their hands, at one time, more than $100,000 of the savings of their work-people, which has been changed into other channels. There is no doubt that their deposits now exceed this sum largely.

4. Quite a number of the work-people own *houses* free of debt, while others have been partially assisted by the company, it receiving a portion of their wages each month in reduction of the debt. More than $50,000 are thus invested.

5. Others invest their funds in the bonds of the United States Government in preference to savings banks.

6. Several of the workmen are owners of the *stock* of the company, and have the same rights in regard to the control of the officers and general management as other stockholders.

7. Investments of earnings in premiums on *life insurance* have been made by many of the workmen.

8. More than one of the workmen have been members of the City Government in its board of aldermen and common council, and not an annual election passes without the choice of one or more to some of these important offices.

The pecuniary success of the company has warranted a liberal spirit in the payment of wages to the work-people. The least sum now paid in weekly wages to the youngest employed is $1 82 in gold, and the number belonging to this class is very small. Boys of sixteen years do not receive less than $2 85 in gold weekly. The least amount paid weekly to men is $6 75 in gold, while a very large majority receive much more. Females receive from $2 48 in gold weekly to $6 72, while a few earn more. This excepts young girls, whose wages are the least sum named above.

Spinners, weavers, and a few others, are paid in accordance with their products, some of them earning very large wages.

The stockholders, as previously stated, have invested $2.500.000 in the company. During the past twelve years they have received in dividends more than $3,000,000, and the fixed property has cost a much larger sum than the amount of the capital stock. The treasurer, furthermore, holds in his possession a very large amount of undivided earnings, with which to purchase cotton, wool, and other materials, for cash.

PROGRESS OF THE WORKING CLASSES.

We have received from Messrs. Geo. Routledge & Son, No. 416 Broome street, a volume of 300 pages, bearing the above suggestive title. The work embraces a great variety of topics, bearing upon the social condition of the overwrought working classes of Great Britain, and the moral and legal agencies employed toward their reformation during the past thirty-five years. The information and the statistics contained in this volume, are worthy to be studied by every manufacturer in our country who employs a considerable number of hands.

The cotton manufacturers of Manchester were a shrewd, sturdy, square-set, selfish body of men more conspicuous for their business management than for humanity in dealing with those whose labors were necessary to the success of of their undertaking. It is not to be wondered, therefore, that the evils growing out of this state of things were of a dreadful character. The absence of education stunted the mind while increasing labor dwarfed and deformed the body, and the short hours of relaxation from toil allowed to the factory worker, were commonly spent in the most sensual and degrading pursuits until the evils were almost unbearable.

The testimony of an English philanthropist, given in 1832, says:

"The population employed in the cotton factories rises at five o'clock in the morning, works in the mills from six until eight, and returns home for half an hour or forty minutes to breakfast. This meal generally consists of tea or coffee, with a little bread. The tea is almost always of a bad, and sometimes of a deleterious quality. The operatives return to the mills and workshops until twelve o'clock, when an hour is allowed for dinner. Among those who obtain the lower rate of wages this meal generally consists of boiled potatoes. The mess of potatoes is put into one large dish, melted lard and butter are poured upon them, and a few pieces of fried fat bacon are sometimes mingled with them, and but seldom a little meat. Those who obtain better wages add a greater proportion of animal food to this meal, at least three times in the week; but the quantity consumed by the laboring population is not great. The family sits around the table, and each rapidly appropriates his portion on a plate, or they will plunge their spoons into the dish, and with an animal eagerness satisfy the cravings of their appetites."

After thus describing the half-savage domestic habits of the people, he goes on to describe their general surroundings: "The population nourished on this aliment is crowded into one dense mass in cottages separated by narrow, unpaved, and almost pestilential streets, in an atmosphere loaded with smoke, and the exhalations of a large manufacturing city. The operatives are congregated into mills and workshops during twelve hours in the day, in an enervating heated atmosphere, which is frequently loaded with dust or the filaments of cotton, or impure from constant respiration, or from other causes. They are drudges, who watch the movements and assist the operations of a mighty material force, which toils with an energy ever unconscious of fatigue. The state of the streets powerfully affects the health of their inhabitants; sporadic cases of typhus chiefly appear in those which are narrow, ill-ventilated, unpaved, or which contain heaps of refuse or stagnant pools."

"What were the amusements of the masses, thus overworked, ill-fed, ill-housed,—left for the most part uneducated? Large numbers of working people attended fairs and wakes, at the latter of which jumping in sacks, climbing greased poles, grinning through horse collars for tobacco, hunting pigs with soaped tails, were the choicest diversions. An almost general unchastity—the proofs of which are as abundant as they would be painful to adduce—prevailed among the women employed in factories, and generally throughout the lowest ranks of the working population. But drink was the mainspring of enjoyment. When Saturday evening came, indulgences began which continued until Sunday evening. Fiddles were to be heard on all sides, and limp-looking men and pale-faced women thronged the public houses, and reeled and jigged till they were turned, drunk and riotous, into the streets, at most unseasonable hours. On the Sunday morning the public houses were again thronged that the thirst following the indulgence of the night might be quenched. When church hour approached, however, the churchwardens, with long staves tipped with silver, sallied forth, and, when possible, seized all the drunken and unkempt upon whom they could lay their hands, and these, being carefully lodged in a pew provided for them, were left there to enjoy the sermon, while their captors usually adjourned to some tavern near at hand, for the purpose of rewarding themselves with a glass or two for the important services they had rendered to morality and religion. In fact, sullen, silent work alternated with noisy, drunken riot; and Easter and Whitsuntide debauches, with an occasional outbreak during some favorite 'wakes,' rounded the whole life of the factory worker."

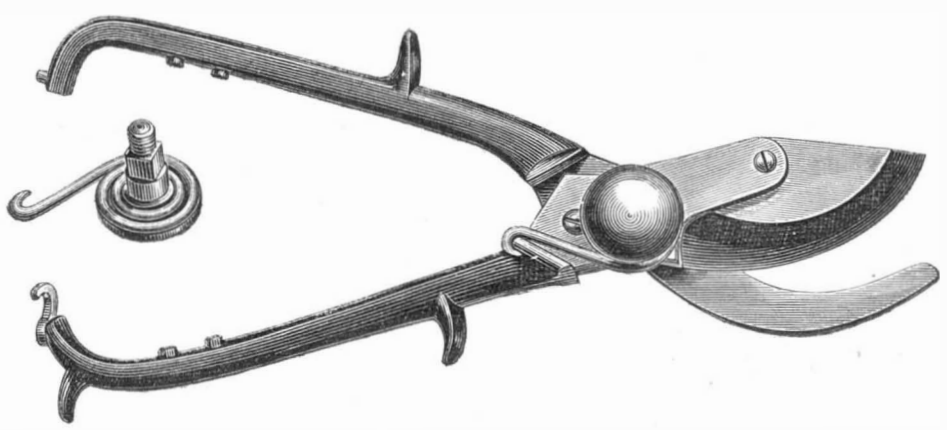
It appears from the volume before us that the first efforts towards the reformation of factory abuse began among the more thoughtful of the operatives who proposed the "Short Time Bill," the agitation of which brought about the organization of trade societies, in nearly all of which there was a tendency to violence. Riots were not uncommon, and the union men habitually refused to work with non-union men or "Knobsticks," as they were nick-named, and often maltreated and even murdered them.

The mercenary practices of employers had become so oppressive that human nature broke down under the severe burdens heaped upon the working classes and under the infliction of wrongs to which those in power seemed indifferent, it cannot be wondered at, though always to be regretted, that violent demonstrations were put forth. The volume briefly sketches the various agencies brought into existence to refrom the abuses of the factory system, and now it appears that progress has been general and continuous, and that chiefly through influences which have proceeded from the class itself.

At the present moment in Europe, as well as our own country, the factory system is vastly improved and improving. The operatives are not degraded by ignorance and vice, and children are not allowed to enter factories and to be excluded from the privilege of schools and such outdoor exercises as tend to develop the mental and physical powers. We are happy to record the progress of the working classes.

Improved Spring and Bolt for Shears.

The object of this invention is to arrange a spring for opening the blades and jaws of scissors, shears, hand nippers, punches, etc., which shall be always effective and out of the way of the hand in using the implement. The engraving shows a pair of pruning shears with this improved spring. The details are shown plainly in the small figure.



BERGNER'S SPRING AND BOLT FOR SHEARS.

The bolt which holds the two blades in connection, has a broad cap or head that conceals and retains in place a coiled spring, one end of which passes through a hole in the shank of the bolt under the head, and the other, formed into a hook, engages with a projection made on the handle of one of the blades. Soon as the pressure of the fingers is relaxed, the tension of the spring acts on the handle of the jaw and throws the blades apart. The rivet or bolt is secured by a nut on its end in the usual way, one blade fitting a squared place on the shank of the bolt and the other turning freely on the cylindrical portion.

The patent bears date of June 23, 1868, and all applications for rights, etc., may be made to the patentee, Georg Bergner, or to L. Wattenberg, Washington, Mo.

Poisonous Champagne.

It is much to be doubted whether alcohol or any of the sparkling and seducing liquors which contain it are to be considered, even when pure, as anything but poisons. The following extract from the *Grocer* will show the character of the factitious substances which are vended in modern times, and may prove both interesting and instructive:

"'There is nothing but roguery to be found in villainous man!' exclaimed Sir John Falstaff on detecting lime in his sack. Could the fat knight now revisit the earth, he would have to admit that the art of doctoring wines had been carried far beyond the stage reached when 'a cup of sack with lime in it' set him moralizing on human depravity. He would have an opportunity of trying 'something sparkling,' compared with which limed sack was a harmless mixture. We cannot blink the fact that much of the so-called 'champagne' which is ostentatiously set before heated guests at public and private assemblies is simply the product of fraudulent ingenuity—a detestable counterfeit which resembles the natural wine just as the Champagne Charley of the music halls resembles a finished gentleman. Its color and flavor are adventitious, its *bouquet* is artificial, and its

"Beaded bubbles, winking at the brim."

may be traced to the condenser of a modified soda water machine. Happily a disputed contract has led to an exposure which will probably check the further growth of the British champagne trade. From the recent case of Cox against Barnett we gather many interesting particulars respecting the fabrication of this aerated stuff. Our present object is to call special attention to the chemical facts elicited at the trial of this case, and to explain our reasons for believing that 'champagne' of British manufacture is generally contaminated with lead. The case was an action to recover damages from a machine maker for a breach of contract. With the laudable intention of carrying on business as a manufacturer of aerated wines, the plaintiff purchased from the defendant, at the cost of £135, a champagne machine, on the understanding that it was capable of producing a hundred quarts of champagne or aerated wine daily. The 'champagne,' in its 'still' condition, consisted of light white wine, fortified and flavored with a sirup technically termed '*trente-six*,' and to convert it into sparkling wine it had to be impregnated with carbonic acid gas in the condenser of the machine. According to the plaintiff, the wine left the condenser turbid, and those who tasted it suffered severely from sore lips. Dr. Matthiessen, F. R. S., the eminent chemist of St. Mary's Hospital, submitted the product to analysis, and actually extracted from a single gallon no less than four grains of metallic lead, in quantity corresponding to about two thirds of a grain per bottle! With characteristic acuteness, he then performed a number of experiments to determine the action of lead and solder on samples of wine originally free from lead, and in every case he found the wine contaminated with the poisonous metal. We have had an opportunity of checking Dr. Matthiessen's results, and can vouch to their accuracy. The free acid of the wine attacks lead and solder with great rapidity, and, by suitable processes, the dissolved lead can be separated from the wine and weighed. An examination of the condenser in court brought to light the source of the lead, for almost the whole of the interior was found to be covered with solder. The principal witness for the defendant was a champagne manufacturer of twenty-five years' experience, not from the department of the Marne, but from an unrecognized wine district in the city of London. This gentleman swore that neither, tin, lead, nor solder would affect the wine; that the condenser exhibited was a first rate article; that he himself had for a long time manufactured 'champagne' with the aid of similar machines, and that one of his condensers contained a lump of solder as big as a hen's egg! He did not inform the court whether the unhappy consumers of his wine had escaped lead colic. The examination of this witness elicited the curious fact that he imported grapes from France to make champagne in London." French champagne made in England!

ALASKA.—Late advices from Alaska are very encouraging. Coal mines have been discovered near Sitka, on the mainland. The quality is considered unequaled, and the seam is over twenty feet wide and traceable for some distance. The coal was tried on the United States steamer *Saginaw* and pronounced excellent. It has the appearance of pure anthracite, and is superior to any Lehigh coal. In addition to this discovery, Alaska is likely to become a place of fashionable resort in hot weather.

WINE is becoming an important article of manufacture in Kansas. The Lawrence papers state that the wine producers are now actively employed in gathering an abundant crop of summer grapes.

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COPERNICUS BY EARTH LIGHT.

On page 82 of the current volume, we gave a condensed report of a lecture by Professor Morton, of Philadelphia, and of the magnificent experiments by which the lecture was illustrated. We also described some splendid photographic views of the moon, and of the planet Mars, among which was the view of the lunar volcano Copernicus. We herewith reproduce this view from the Journal of the Franklin Institute, and we feel that in so doing we are presenting an engraving that will prove of the greatest interest to our readers. Who does not long, while gazing upon the serene face of the queen of night, as she glides in majesty over a cloudless sky, to know and see the hidden wonders of her structure? Her mean distance from the earth is two hundred and forty thousand miles, yet it is hard to realize on one of those glorious autumn evenings which occur in our latitude, that she is so far away. It is even harder to realize that her fair face is seamed, and scarred, and blotched, and torn—a scene of the wildest confusion, a dreary, barren, and lifeless desert, only variegated by rude precipices of enormous height and extinct volcanoes, which, in their former active state, must have presented a spectacle of the aroused forces of nature beyond conception, awful, and sublime.

We ordinarily see the moon by means of the light of the sun reflected from her surface. During one half of her revolution, however, the sun shines upon the portion of her surface which is entirely or partially turned away from us, leaving the side which is toward us, dark, with exception of the light which falls upon it from the stars and planets, and the light of the sun reflected from the earth. Surfaces are good reflectors of light, in proportion to their smoothness. A body like the earth can, therefore, be only an imperfect reflector. Even the water, which, if at rest, would form a more perfect reflecting surface than the land, is rarely perfectly still; and the regions near the poles, where the water is congealed into snow and ice, present also great irregularities of surface. Color has also much to do with the amount of light which bodies reflect, and all reflecting bodies which have not pure white surfaces, modify more or less the character of the light which they reflect. Snow is, therefore, a better reflector than the bare earth, both because it is white, and its surface is smoother than the land which it covers. All bodies seen by reflected light are less illuminated than the reflecting surface. The moon, viewed only by the reflected light of the earth, stars, and planets, is, therefore, very dimly seen. The eye, unassisted, can scarcely see more than the mere outline of her form. When the moon is entering upon her first quarter, she may be seen as a thin crescent upon that side of her disc which lies nearest the sun. The remaining portions being only just perceptible. The dark portions of the moon which, seen at the full, are fancied to resemble the human face, are shadows cast by the summits and craters of extinct volcanoes. The principal mountains which form these shadows are called Tycho, Copernicus, and Kepler. The largest of these is Copernicus, which has a crater fifty-five miles in breadth. Its height above the surrounding plains is eleven thousand two hundred and fifty feet.

The engraving represents this immense crater as seen by earth-light. It is a vast plain surrounded by a circular wall, with central cones and huge boulders scattered over its surface. Mars, proportionately magnified, is seen above the horizon, with masses of clouds floating in his atmosphere, and showing the marks of continents and seas. In the immediate vicinity are seen lesser craters, their edges illumined, and inclosing gulfs of vast depths and proportions. The rugged and mountainous appearance of the moon is admirably shown, and the appearance of desolation most truthfully delineated. What features are presented by the side of the moon which human eyes have never seen we cannot certainly say; but it is probably just to infer that it possesses the same general characteristics as the side presented to us. The craters of some of the lunar volcanoes are of immense depth, their sides rising almost vertically, often to a height of many thousand feet.

In 1787, it was announced by Sir Wm. Herschel that he had observed three volcanoes in a state of eruption upon different parts of the moon. Astronomers have, however, generally supposed that the phenomena seen by Herschel were due to peculiar reflections of earth-light from portions of the peaks having great reflecting power. There have been, without doubt, some recent changes in the craters, which are found everywhere upon the moon's surface. In 1866, Schmidt, Director of the Observatory of Athens, observed the total disappearance of the deep crater Linné. In its place remained only what appeared to be "a little white cloud." This obscuration, which was observed by other astronomers, occurred in October and continued till the latter part of December, when the crater was again distinctly visible. The cause of this phenomenon has never been explained; but it indicates that the forces which have so convulsed the surface of the moon in ages past, have not yet fully expended their energies.

A SINGLE coffee plant, taken from Arabia to Paris, in 1614, was the parent stock of all the coffee plantations in the West Indies.

Correspondence.

The Editors are not responsible for the opinions expressed by their correspondents

Experiments---The Condensation of Alcohol by Frost.

MESSRS. EDITORS:—Being induced to believe that the severe frosts of winter may be utilized in the condensation of alcoholic liquids, by the freezing of the water combined with the alcohol, and subsequent separation of the water by draining off the unfrozen liquor, leaving the water in the bottle as ice, I instituted the below-described experiments to satisfy myself as to the correctness of this idea:

A bottle of pure new grape wine, having been exposed at a low temperature, appeared to have become frozen. Upon examination I found that its contents were only partially frozen, a feathery crystallization filling the bottle, the interstices between which were occupied by the unfrozen liquid. Suspecting that this latter was prevented from freezing by the greater amount of alcohol which it contained, I decanted the unfrozen liquid into another bottle, leaving the ice (or water) in bottle No. 1. Though the liquid thus decanted remained a liquid, the ice in No. 1 remained unthawed. No. 2 was finally frozen, however, by the increasing severity of the weather (winter of 1867–'68), which, as the technical nature of the experiment demanded, was my only reagent for reduction of temperature. A crystallization similar to that in the first instance also existed throughout the contents of the second bottle, No. 2; but as before, a portion of the liquid did not congeal. This also was decanted, the operation being repeated until the original wine had been separated into five portions, the last decanted of which—the fifth—which was of a ruby red color—refusing to congeal even at a temperature of from 28° to 30° Fah.

The liquids thus separated had the following peculiarities: The liquid in bottle No. 1, which was obtained by thawing the ice, formed in the first instance by the partial congelation of the wine, was greater in amount than any of the separated liquids, having a slight amberish tint, though almost clear.

No. 2. This liquid was one quarter less in amount than that in No. 1, but had much the same color and quality, containing, however, a little organic, saccharine, and volatile matter, with tartaric acid, depositing one half to one quarter of a minim of sediment from seventy-five minims of liquid.

No. 3. The liquid in receptacle No. 3 was still less in amount, one quarter less than the contents of No. 2. Color, red amberish, light tint of red prevailing. Organic, volatile (alcoholic), and acid matter, etc., were present in increased quantity.

No. 4. Amount of liquid one quarter less than No. 3. Color, clear red; about five minims in one hundred and eighty minims of liquid, being a faint reddish sediment of organic matter, containing much tartaric acid.

No. 5. The amount of liquid was similar in its proportion to the rest, being about equal to three quarters of the contents of No. 3; its specific gravity being perceptibly greater than any of the preceding. Color, deep, rich red; liquid, sirupy and rich.

The comparative amount of liquid, color of, and specific gravity of, was, in a sort of proportion, much as below:

LIQUID No.	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.
Amount of liquid in dr., and fractions of.	94	7·05	4·7	3.525	2·1+
Color of liquid.	Clear.	Amberish.	Faint Red.	Red.	"Deep rich Red."
Specific gravity in proportion of.	0·6	0·7	0·8	0·9	1·0

The next step taken in the examination of the separated liquids was a fractional distillation; or the separation by heat (in the form of vapor) of the different substances existing in the liquids.

No. 1. The liquid denominated "No. 1" was not distilled, being little but water.

No. 2. Also undistilled (only differing from No. 1 in leaving a sediment).

No. 3. One hundred and eighty minims of this reddish liquid being distilled, gave one hundred and fifty minims clear distillate; thirty minims remaining in tube-retort, and consisting of fined carbon and yellow volatilizable matter, which latter was almost inappreciable. It was probably derived from the decomposition of the sugar present. About five minims out of one hundred and eighty minims was a precipitate containing tartaric acid.

No. 4. One hundred and twenty of the clear red liquid being distilled, yielded one hundred and ten minims, clear distillate; about three minims of yellow liquid of empyreumatic odor was rendered by severe heat (fusing of tube retort), and seven minims of fixed carbon, etc., remained. About four minims in one hundred and eighty minims was a brown sediment containing much tartaric acid, together with some organic or microscopic vegetable matter. Alcohol and sugar, undetermined; though the former was present in some quantity in the clear distillate, and the latter (sugar) existed in quantity in the remainder, being afterward metamorphosed by heat into the yellow liquid and fixed carbon.

No. 5. In this instance the record of amounts and results distilled was unfortunately lost; however, the general tenor of the experiments suffices. This was the rich, blood-red liquid, heavy and sirupy; greater in specific gravity than any of the preceding. From its characteristics I was led to suppose that I had succeeded in condensing nothing but the sugar. Here, however, I was mistaken; the clear distillate which first passed over was a proof spirit, inflammable. A piece of paper dipped in it was lighted upon being brought near flame. Much of the yellow liquid before described passed over with severe heat, and considerable "fixed" carbon remained in tube, covering the sides of tube with a black scale that shrunk with a "crinckling" sound upon the cooling of the tube.

From the result of these experiments I was led to infer that the process of freezing and decantation, etc., had been one of condensation.

That from the regular increase of specific gravity in the liquids, something besides alcohol was being condensed. From the results of distillation, caromel and yellow liquid, having the odor of burnt, or, rather, decomposed sugar, sugar was supposed, also, to have been condensed. Tartaric acid, or tartrates, were also condensed.

My conclusions are, that, by the method described, alcoholic liquids, wines, etc., may be condensed; the sugar, alcohol, and tartaric acid, being the condensed substances. I have thought that the condensation of the sugar was more complete than that of the alcohol and tartaric acid.

A hundred casks of wine, of an inferior grade, may, by freezing and decantation in the winter season, be condensed into a less in amount, but stronger, more sirupy, and valuable "port" wine.

It is a fact, that, from a barrel of fermenting cider, well frozen, may be drawn gallons of strong drink, unfit for temperance folk.

It is a fact of the "Sugar Bush," that maple sugar-makers, when, on a sharp morning, they find a bucket of sap standing half frozen under the tap, throw out the clear, tasteless ice, and find a thick syrup beneath.

Hoping that these hasty notes may not be without interest, and, perhaps, of assistance to those desirous of pursuing the subject further, or may save others from wasting time upon an already explored field, I remain, respectfully,

Albany, N. Y. VERPLANCK CALVIN.

Change of Pitch in the Tone of Moving Bodies.

MESSRS. EDITORS:—In regard to this subject—first mentioned by a correspondent, page 247, Vol. XVIII, and correctly explained by Mr. Welling, page 323, same volume—it may be remarked that I was present at the first experiments, made in Holland about the year 1845, on the railroad from Amsterdam to Rotterdam, of which the purpose was to ascertain if practice would fully verify the teachings of theory, as to the amount a musical tone would become sharp or flat, when the distance between the ear and the instrument producing the tone was rapidly diminishing or increasing. It was done simply by sounding a trumpet or other loud musical instrument on one train, and observing carefully the pitch on the other train passing in an opposite direction, or similarly sounding the instrument on board the passing train and observing it upon the road, or *vice versa*. The results were always perfectly in accordance with the theory.

The theory is very simple. For instance, the middle C of the musical scale makes 256 vibrations in one second, which are transmitted with a velocity of nearly 1,100 in the same time. Suppose now we could move toward the sounding body with a velocity of 1,100 feet in a second, twice the number of vibrations, or 512, would reach our ear, which corresponds with the octave above and the tone would appear an octave higher. Such velocity is, however, at present beyond the power of actual experiment, but the illustration serves to make the theory clear. As the octave is divided into twelve so-called semitones, we can easily find how fast we have to move to raise the pitch a semitone; namely, the twelfth part of the velocity of sound or about ninety feet in

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a second, about sixty miles an hour or one mile in a minute. When we move from the sounding body with this velocity, the opposite will take place; one twelfth of the vibrations will reach our ear and the tone will appear flattened a semitone. When the sounding body moves and we are at rest the effect will be the same. as is self-evident.

When two railroad trains are passing one another and one locomotive sounds the whistle, the passengers in the other train will hear a higher note, when the trains are approaching, due to the combined effect of the two motions. When each train is moving at a velocity of sixty miles an hour, the rise of pitch will be a whole tone above the real note. When the trains have passed and the distance intervening is increasing at the same velocity, they will then hear the sound a whole tone below the true one. Hence, at the moment of passing a change of pitch will be observed of two whole tones or a major third. Both trains, however, seldom reach this velocity, and the change of pitch usually observed will seldom be more than a minor third, or one tone and a half, which corresponds to a mean velocity of each train of one fifth less than sixty, or forty-eight miles an hour. The same fact is observed in the sound of the locomotive bell when it is rung in passing.

When traveling at night I have often amused myself in noticing the correct interval of this change in pitch; deducing from it the sum of the velocities of the two passing trains. Then, by knowing the size of the drive wheels of the locomotive of my train, and taking into consideration that four puffs of steam correspond always with one revolution, and timing the velocities of these steam puffs, I had the key to the velocity of my train; and subtracting this from the total velocity obtained the velocity of the train which had passed, and of which nothing but the changing pitch of the whistle had been observed. P. H. Vander Weyde, M. D.

New York City.

Explosive Gases in Steam-Boilers.

Messrs. Editors:—The explanation of the highly interesting case, mentioned by a "Practical Engineer," page 35, is evident. When the supply proper refused to give water, there was, of course, a lack of water in the boiler; and, notwithstanding that the engineer withdrew his fires, some part of the boiler became hot enough to decompose the steam, not into its elements (this is a pure speculation, having no fact to support it), but the iron became oxidized by the oxygen of the water, and the hydrogen was set free, which is always the case when steam is in contact with red hot iron It is, in fact, one of the ways to manufacture hydrogen. The boiler being closed, and the hydrogen not soluble in water, it remained there; and when, after cooling, the man-hole was opened, air enough entered to form with the hydrogen an explosive mixture, to which the engineer set fire with his lamp. Any practical chemist, acquainted with the enormous explosive power of oxygen and hydrogen, mechanically mixed in such proportion as they are chemically combined in water, will agree that, if such a mixture had been in the boiler, something much worse would have happened to the engineer and to the boiler also. In this case it was simply hydrogen and common air, which may be considered almost harmless, when compared with the tremendous power of hydrogen and oxygen. P. H. Vander Weyde, M. D.

New York city.

The Use of Ozone in Sugar Refining.

Messrs. Editors:—In your journal of June 23d and August 5th, I notice two articles on the use of ozone as a decolorizing agent in a sugar refinery. Having visited that refinery about six weeks since while in London, I thought that the following facts might be of interest to you.

The first experiments in bleaching sugar by ozone were made in the country, about sixty miles from London, and were a perfect success, changing a dark brown solution of sugar to a straw color in a few minutes, and at the same time depositing all the foreign substances. The result of these experiments being so satisfactory, the owner of a sugar refinery in White Chapel was induced to put up a steam engine to drive an electric machine and bleach sugar by these means; but it has proved a total failure on account of his inability to produce ozone in any quantity. The owner of the refinery attributes this to the air of London being, to a great extent, deprived of that gas by its immense population. Be that as it may, until somebody discovers a means of obtaining that gas in large quantities at a moderate price, sugar refining by ozone will remain in its present condition. H. W. B.

Philadelphia, Pa.

Useful Hints for the Season by Septimus Piesse.

Remedy for Insect Bites.—When a musketo, flea, gnat, or other noxious insect punctures the human skin, it deposits or injects an atom of an acidulous fluid of a poisonous nature. This causes an irritation, a sensation of tickling, itching, or of pain. The tickling of flies we are comparatively indifferent about; but the itch produced by a flea or gnat, or other noisome insect, disturbs our serenity, and, like the pain of a wasp or bee sting, excites us to a "remedy." The best remedies for the sting of insects are those which will instantly neutralize this acidulous poison deposited in the skin. These are either ammonia or borax. The alkaline reaction of borax is scarcely yet sufficiently appreciated. However, a time will come when its good qualities will be known and more universally valued than ammonia, or, as it is commonly termed, "hartshorn." Borax is a salt of that innocent nature that it may be kept in every household; it can be recommended as a domestic and harmless chemical. The solution of borax for insect bites is made thus:—Dissolve one ounce of borax in one pint of water that has been boiled and allowed to cool. Instead of plain water, distilled rose water, elder, or orange flower water is more pleasant. The bites are to be dabbed with the solution so long as there is any irritation. For bees' or wasps' stings the borax solution may be made of twice the above strength.

Water Coolers.—We all know that cold water during the summer is one of the greatest luxuries. When it is generally understood that evaporation produces cold, it will be evident that any vessel or material that favors evaporation will induce this result. Now, all porous and absorbent vessels are of this character. Pottery not glazed is porous. A linen clothed dipped into water is porous, absorbs water, and when exposed to the air the water evaporates, producing cold; hence, if any vessel be covered with a damp cloth, the interior will be colder than the exterior. A water cooler is a porous vessel, which allows evaporation to take place on its outer surface, thus cooling the contents. The water coolers, as sent to us from Staffordshire, have, however, one fault; they are not sufficiently porous; hence there is only a very slow infiltration from the inner to the outer surface, and any minute organic substance that may be in the water is arrested by the crock. After a time, this organic matter, it is often observed, undergoes decomposition, giving a musty, earthy odor to the water that may be in the vessel. When this is the case, it should be cleaned both inside and out, with an ounce or two of strong muriatic acid, rubbing the exterior with a flannel wet with the acid, followed with clean hot water. After this treatment the vessel will be, as before, a good water cooler.

Lemon Kali.—A teaspoonful of this compound in a tumblerful of fresh cold water, forms a very agreeable effervescing summer drink. When made, it must be preserved in a dry place, and in well-corked bottles, otherwise it will soon be spoiled. To make it, take one pound of powdered white sugar, half a pound of bicarbonate of soda, half a pound of citric acid, powdered, and half a drachm of essence of lemon. Sift the whole well together, then put it into dry, wide-mouthed bottles. Tartaric acid may be used instead of the citric acid at less expense, but it is not so good for general use. Citric acid is the true acid of the lemon; tartaric acid is derived from grape lees, tamarinds and other fruit. The pleasing flavor of lemon kali depends much upon the quality of the essence of lemon, which rapidly spoils in druggists' shops, and smells like turpentine. See that you have good and fresh essence of lemon.

Fleas in Dogs.—Fleas trouble dogs, and one of the best remedies is the following: Rub colza or common olive oil into the coat, saturate the hair with the oil to the surface of the skin, let it remain on for half an hour, then well-wash out the oil with the best yellow soap and lukewarm water. A small portion of any sweet oil brushed into the coat of a woolly dog, will prevent its being infected with vermin. Matrons of large schools may advisedly take this hint. Insects of every kind have a "life and death" dislike to grease in any form.

Manufacturing, Mining, and Railroad Items.

An iron steamer, the first ever built there, was launched at Cleveland, Ohio, on Saturday, 25th ult.

It has been suggested in England to unite Scotland and Ireland by a tunnel. The distance of the proposed termini is about fourteen and a half miles, and the cost is set down at £3,150,000.

Sun-dried oysters, cured like beef by hanging in the sun, are becoming an important article of trafic in California.

Ninety locomotives are now in use on the Union Pacific Railroad, and a hundred and seven others have been ordered.

An imperial French decree suspends the tunnage on vessels entering the ports of the Empire with breadstuffs for three months from the 1st of October next. This would seem to imply a short harvest in France.

Discovery of Chloride of Potassium.—A vast deposit of pure chloride of potassium has been discovered in a salt mine in Hungary. This must prove of great commercial value to Austria.

Appropriations for Improvements.—Congress appropriated a million and a half dollars for river and harbor improvements at the late session. Three hundred and fifty thousand dollars go for the improvement of the Mississippi.

New Ocean Steam Route.—A contract was concluded, a short time back, by the Chilian Government with the Pacific Steam Navigation for direct mail communication with England. The voyage out and back must be completed in forty-two days. The first ship sailed on the 13th of July.

Sugar in Brewing.—The use of sugar in British breweries has largely increased. During the year 1867, 41,143,000 pounds were consumed. Narcotic adulterations of an exceedingly deleterious nature are often added to the liquor.

A New Phase in Economy.—A species of co-operation system has been adopted by the Pennsylvania Railroad Company. It is agreed to divide among the engineers and firemen all that they save from last year's expenditure of fuel, oil, and other articles in running their locomotives

Peat as Fuel for Locomotives.—Mr. F. Trevethick, has been making experiments in Canada on the engines of the Grand Trunk Railroad. He seems to have arrived at the conclusion that a tun of peat (2,240 pounds) is equivalent to a tun of the best wood.

Large Salt Mine.—Near Berlin, Prussia, an enormous salt mine has been discovered. The thickness of the bed is five hundred feet, and its extent has not yet been determined.

How a Strike was Conquered.—A shoe manufacturer in North Adams, Massachusetts has conquered a strike in his factory and is now running it with a full force of workmen. He secured forty-three men in Montreal, and now employs none who belong to a "Union."

New Publications.

Happy Hours: A Collection of Songs for Schools, Academies, and the Home Circle By Edward Kingsbury and Alfred A. Graley. New York: Taintor Bros., No 698 Broadway.

A collection of music suitable for children, interspersed with pieces requiring some skill and culture in their execution. The words and the music seem equally chaste and carefully arranged. Both are of a high order. The collection is a good one, and will meet with great favor with teachers, pupils, and families.

Recent American and Foreign Patents.

Under this heading we shall publish weekly notes of some of the most important home and foreign patents.

Mill for Grinding Clay.—Levi Moore, Baraboo, Wis.—The object of this invention is to provide a mill for reducing clay to a pulverulent and plastic state, suitable for building brick or pottery. It consists of the form and arrangement of the grinding devices, the whole being contained within a frame adapted to their operation.

Fence.—Henry J. Culp, Goshen, Ind.—This invention relates to an improvement in fences, and consists in so constructing the panels of which the fence is composed that they can be readily connected and disconnected.

Sickle Bar for Mowing Machines.—G. W. Chapman, Jr., Iowa Falls, Iowa.—This invention relates to an improvement in the construction of sickle bars for mowers and reapers, and consists in forming the bars in two pieces, in such manner as to secure separate cutters or teeth between them, so that the teeth may be easily removed when necessary to sharpen and repair them, or replace any when broken.

Log Sled.—Chas. W. Mosher, East Leon, N. Y.—The object of this invention is to provide a log sled or boat with means to enable the logs to be taken on to the sled through the draft force exerted by the cattle hitched thereto. It consists of an angular or arched frame vibrating over trunnions, which latter have bearings on the sides or runners of the sled, or in suitable pieces of timber affixed thereto, together with a chain and log hooks so arranged that the draft force of the team will act to raise the log and draw it forward upon the sled.

Portable Clothes Rack.—Geo. H. Hammond, Davenport, N. Y.—The object of this invention is to provide a simple, durable, and portable rack for drying clothes. It consists of a central staff having two hubs affixed thereon, the said hubs being formed with jaws in which are provided folding arms and a jointed brace for holding the arms rigidly extended; the drying ropes are arranged at proper intervals on the arms, and the whole to set upon a post and revolve freely thereon.

Belt Tool.—Eben Hester, Suffield, Conn.—The object of this invention is to furnish a convenient tool for fitting belts for machinery. It consists of a square shank set in a handle and bearing two punches for cutting holes in the belt, and two punches having hollow or concave points for heading rivets It is also provided with a flat lacing awl having an eye for carrying the leather lacing strip.

Coupling for Sickle Pitmans.—O. P. Drury, Niles, Mich.—The object of this invention is to provide a strong, durable, and easily working coupling device for connecting the pitmans of a reaping or mowing machine with the sickle back of the same.

Lamp.—S. C. Brockington, Groton, Conn.—The object of this invention is to construct a lamp for kerosene and other hydrocarbon liquids, in which the wick will always be equally far inserted in the liquid, so that thereby a steady and equal flame will always be obtained. The object of the invention is also to provide an oil reservoir and connections by means of which any number of lamps can be supplied with the necessary fuel.

Writing and Drawing Desk.—Wm. W. Levering, New York city.—This invention relates to a new desk, which is provided with slates, blackboards, and transparent ground glass plates, in such manner that they will be convenient for teachers, artists, and business men.

Fly Frame Flyer.—James S. Streeter, Providence, R. I.—This invention relates to a new and improved method of constructing flyers for the twisting of yarn, whereby the same are more economically made, and whereby the roving is more effectually prevented from flying out when running.

Rice Cultivator.—Geo. W. Cooper, Ogeechee, Ga.—This invention relates to a new rice cultivator, by which the ground between the drills is broken up, without throwing clods upon the plants, and without forming furrows and hills between the drills.

Sashes and Window Frames.—Johann Schnell, New York city.—This invention relates to a new manner of constructing window frames, with a view of facilitating the cleaning of the glass panes, the replacing of broken panes, and the repairing of broken sash cords. The invention consists in hanging the frame in which the sashes move up and down to the casing of the windows, so that it can be folded or turned like a folding window, and still be provided with sliding sashes.

Extension Wardrobe Frame.—Elias Gill, New York city.—The object of this invention is to construct a frame for a portable wardrobe, in such manner that the same may be freely and readily extended and contracted as to length and width, according to the room which it is intended it should occupy. The invention consists in connecting the four posts of the frame, which fit with their lower ends into slotted bars or beds, longitudinally as well as transversely, with toggle levers or slotted extension levers, or both, so that they can, longitudinally as well as transversely, be moved any desired distance apart.

Elastic Supports for Car Seat Backs.—Geo. Higginson, Newark, N. J.—This invention relates to a new device for supporting the arms of car seat backs and for receiving the shock when the same are reversed. The invention consists in the use of bolts or blocks which are resting upon spring or other cushions, and which are secured to the sides of the seat, so that the arms, to which the back is secured, may rest upon the upper ends of these elastic supports, and may, if the back, is reversed and suddenly let fall, find a yielding support.

Grate for Stoves and Furnaces.—A. J. Magoon, Providence, R. I.—This invention relates to a new grate for stoves, ranges, and furnaces, which is so arranged that it can at the same time serve as a grate and ash sifter. The grate is of circular form, and is at its center, by a vertical pin, pivoted in a horizontal shaft. On one side the grate is supported by a fixed lug, so that it cannot be dumped to that side. If by suitable gearing connection the grate is revolved around its vertical axis in one direction, it will simply obtain the said motion and will cause the coal held on it to be thoroughly shoved and sifted, but if revolved in the opposite direction, it will not be held by the lug and will swing around the horizontal axle and be dumped.

Ice Pitcher.—Thomas Leach, Taunton, Mass.—In this invention a detachable and removable lining, of glass, china, or earthen ware, is employed, and in connection with it a combined valve and filter of peculiar construction, together with a novel and convenient device for holding the lining firmly in the pitcher and at the same time preventing it from fracture by the sliding of the ice.

Machine for Disintegrating Cemented Gravel.—J. B. Cox, San Francisco, Cal.—This invention relates to an improved machine by means of which the compact gravel that abounds in and about the gold mines of California and elsewhere can be readily disintegrated, so that the gold which it contains may be separated from it.

Pocket Counter.—Jacob S. Detrick, San Francisco, Cal.—The object of this invention is to provide a neat and convenient pocket instrument by which the velocity of shafting, etc., can be accurately determined.

Manufacture of Brooms.—Robert F. Dobson, Goderich, Canada.—This invention relates to an improvement in the mode of securing the broom proper, or the corn to its handle, and it consists, first, in so fastening the broom corn that the free portion shall extend toward the upper end of the handle and then bending or turning the said corn back upon itself and there securing it.

Portable Fence.—Joseph W. Norman, Eugene, Ind.—In this invention the pickets are connected together by links, and each panel is so attached to its supporting posts that it can readily be detached and folded or rolled up, forming a compact and easily portable roll. The form of the posts is also new.

Screwdriver.—W. S. Goss, Baltimore, Md.—In this invention the handle is made of three pieces connected by clutches and stops in such a manner that its lower part can be turned continuously in either direction without releasing the hand from the upper part. In addition to this improvement, the blade is provided with an adjustable tool holder, which can be employed for holding gimlets, augers, awls, etc., while inserting them into or removing them from the wood

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POLISHING SCHOOL SLATES.—William Kester, Cherryville, Pa.—In this invention the slates are supported upon a car which runs under the grinding stones or wheels, and alternately raises the slates against or depresses them from the stones. The cars are caused to rise and fall gradually and yet preserve a perfect level, by means of a series of inclines.

EXCAVATOR.—Chas. F. Woodruff, Newbern, Tenn.—This invention relates to that class of excavators in which a revolving scraper is employed, and consists in so adjusting such scraper, and the means for operating it, that it can be worked more conveniently than heretofore.

BENCH VISE.—O. H. Gardner, Fulton, N. Y.—This invention has for its object to improve the construction of bench vises so as to enable them to adjust themselves to the form of the object to be held, and to enable them to be adjusted so that the jaws may stand at any desired horizontal angle with the bench, and which shall at the same time be simple in construction, and easily adjusted.

METHOD OF PRODUCING SILK FROM MULBERRY TREES.—Wilhelm Holdmann, New York city.—This invention relates to a new method of preparing a good quality of silk directly from mulberry trees, without requiring the aid of the silk-worm. Silk can, by this method, be made as good as from the worm, and at least at half the expense. The preparation can be carried on profitably on a small scale by manufacturers. The production is increased from year to year with the growth of the trees.

MACHINERY FOR MAKING LOOM HARNESS.—Joseph Sladdin, Lawrence, Mass.—This invention relates to certain improvements in machinery for weaving loom harness, whereby, by an automatically operating machine, one is enabled to form the heddle eye, and at the same time secure the yarn to the rig bands in a firm and substantial manner.

MEDICAL COMPOUND.—N. H. Cass, Henryville, Ind.—This invention relates to a remedy for the disease known as "hog cholera"

STEAM EXHAUST DEVICE.—Robert Brown, Norwich, Conn.—The object of this invention is to so construct a steam valve movement for the exhaust of the steam that it shall be self-acting and moved exclusively by the pressure of the steam, and it consists in operating two disk valves upon a rod in a partitioned steam chest, connected with the cylinder whereby the engine cylinder is relieved of undue pressure at its exhaust end, and also of the water of condensation.

SCREW DRIVER.—Isaac Allard, Belfast, Me.—This invention consists in making the shank of the screw-driver in a spiral form by twisting or otherwise, and operating it in a tube by a spiral spring, whereby the screw driver is made self-revolving.

TATTING SHUTTLE.—Ira H. Stockwell, and Lizzie C. Goodwin, Worcester, Mass.—This invention relates to the construction of an article called a shuttle, which is extensively used by females in fabricating what is known as "tatting," a kind of trimming or edging for female under-garments.

DEVICE FOR MARKING BAGGAGE.—G. S. True, Leavenworth, Kansas.—This invention relates to an improvement in the method of marking trunks, chests, boxes, and other similar articles used by travelers for transportation from place to place as baggage, or for other purposes.

FIRE BACK.—D. Hattan, Zanesville, Ohio.—This invention relates to an improvement in the backs of fireplaces. and it consists in arranging a horizontal sliding plate thereon, and providing for the admission of cold air, whereby a more perfect combustion of the gases which are evoked from the fuel is obtained.

GLASS FURNACES.—Miles Granger, Saratoga, N. Y.—This invention consists in providing a peculiarly constructed melting pot, whereby one is enabled to melt and blow glass without intermission, and by which improved melting pot, pursued perpetual glass melting and blowing process.

LET-OFF MECHANISM FOR LOOMS AND OTHER MACHINES.—William Hall, North Adams, Mass.—This invention relates to a new and improved let off mechanism for looms and other machines, in which a warp or web is required to be increased or let off from a shaft, with as uniform a tension as possible. The object of this invention is to obtain a simple means to effect the above result, and one which will keep the warp or web at a uniform tension throughout, or from the commencement of the let-off to the end of the same.

FOLDING CHAIR.—J. Nicolai, Boston, Mass.—The present improvement consists in connecting the legs and seat of the chair in such a manner that said parts will move simultaneously in folding and unfolding the chair, thereby rendering the chair capable of being adjusted (folded and unfolded) with far greater facility than hitherto.

MACHINE FOR CLEANING THE FIBER FROM THE HULL OF COTTON SEEDS.—Thos. W. Brown, Cudworth, Barnsley, Yorkshire county, England.—This invention consists essentially in accomplishing the same by the application of heat under such arrangements of apparatus, and by such applications as hall be found most advantageous for the same.

HOMINY AND PEARLING MILL.—E. A. Duer, Decatur, Ill.—This invention consists of a rotating shaft provided with beaters arranged to rotate in a horizontal cylindrical case, to which the grain is fed by suitable mechanism, and from which it is passed away through a fan and a separating screen.

ELEVATOR BUCKET.—O. W. Clark, Appleton, Wis.—The nature of my invention relates to improvements in elevator buckets, the object of which is to make them more durable, less liable to catch in the cases, and to make them of greater capacity.

ALARM LOCK.—Nash Cheek, Chapel Hill, N. C.—This invention relates to a lock of simple construction, which is designed to be unpickable, and capable of being applied in all cases where an ordinary lock may be used, and in combining with said lock an alarm.

PRUNING SHEARS.—Daniel Campbell, Elizabeth, N. J.—This invention relates to a new and useful improvement in pruning shears whereby the latter, when required, are rendered available as fruit pickers; the construction of the implement being such that the picking attachment will not interfere in the least with the pruning or cutting mechanism.

SEED PLANTER.—Moses Atwood, New Sharon, Iowa.—This invention relates to a new and improved machine for planting corn, and other seed designed to be dropped in check rows, and it consists in a novel construction and arrangement of parts, whereby the seed may be dropped or planted perfectly even or in hills at a uniform distance from each other and the working parts readily operated by the driver.

PATTERNS FOR TRIMMING HAT BRIMS.—C. M. Hawes, New York city.—This invention relates to a new and useful improvement in patterns for trimming hat brims, and it consists in attaching the pattern to a revolving frame constructed and arranged in such a manner as to admit of one pattern being readily detached from the frame, and another of a different size readily applied to it, so that hat prims of different sizes may be trimmed, the revolving frame admitting of the work being done very expeditiously and in a perfect manner.

WATER WHEEL.—John Y. Lanfair, Queensbury, N. Y.—This invention relates to a new and improved water wheel of the class which are placed on a vertical shaft and work within a scroll or curb. The wheel is designed to be submerged, and is constructed in such a manner that power is obtained from the water both by impact and reaction.

DEVICE FOR FEEDING SAW DUST AND SHAVINGS TO FURNACES.—J. A. McClelland, Vernon, Ind.—This invention relates to a new and improved device for feeding saw dust, shavings, etc., to furnaces, and is designed more especially to be applied to wood-working machines, such as planers, circular saw machines. etc., etc., in order to take the shavings and dust from the same and convey or force them direct into the furnace.

CURTAIN FIXTURES.—Davis E. Long, Pawtucket, R. I.—This invention relates to a new and useful improvement in curtain fixtures, and consists in a novel means employed for attaching the tassel to the lower end of the curtain. At present the tassel is attached by boring a hole through the stick which is inserted in a bend at the lower end of the curtain, and passing the tassel cord through the hole in the stick and curtain, and securing the ends of the cord in the heads of the tassel. This plan is objectionable for two reasons; first, the hole in the stick weakens the same, rendering it liable to break; second, the detaching of the tassel to admit of the stick being withdrawn when the curtain requires to be washed, and the attaching of the cord of the tassel to the curtain are attended with considerable trouble.

FILE-CUTTING MACHINERY.—Sedgwick A. Sutton, Dixon, Ill.—This invention relates to certain new and useful improvements in file-cutting machinery, and is more especially designed to be applied to a file-cutting machine, for which Letters Patent were granted to Edward Bucklin, bearing date Feb. 27th, 1866. The present invention relates, first, to an improvement in the hammer shaft, whereby the teeth are cut more perfectly than hitherto, and the chisel, in its descent, prevented from cutting off a tooth made by a previous cut, a contingency of not unfrequent occurrence in the operation of other machines. The invention relates, second, to an improved pressure roller, the manner of applying it to the machine, etc., whereby it may always be adjusted at a proper distance from the chisel. The invention relates, third, to an improvement in the screw feed, the half nut pertaining to the same, whereby all play or back lash is avoided.

NURSERY CUP.—J. F. Leslie and Edwin A. Tibbets, Woburn Mass.—The object of this invention is to furnish an article or vessel for heating liquids by the use of alcohol (or some equivalent combustible liquid), which shall be simple, cheap, and convenient, the same being intended more particularly for treating milk for children, water for shaving, as well as for all other purposes for which it is adapted; and it consists in a funnel-shaped cup with a handle and spout thereto, and combined with a disk-shaped base with a projecting center and a wire support for the cup, which base serves as a cover for the cup when the cup is not in use. Patented July 28, 1868.

MACHINERY FOR SEPARATING ORE AND OTHER GRANULAR SUBSTANCES.—Stephen T. Pearce, New York city.—This invention consists according to one example of my invention in the employment of a vertical hollow rotating cylinder to which the pulverized ore is fed by any suitable means and which is formed with lateral discharging tubes near the bottom through which the ore or other substance is impelled by the centrifugal force due to the rotation of the cylinder in combination with graduated annular receptacles under the said cylinder into which the substance will be discharged according to its specific gravity,

YOKE FOR ANIMALS—F. M. Shields, Macon, Miss.—This invention consists in metallic hooks arranged to be suspended from the heads of the animals in a manner to hook into the fence to prevent jumping or throwing it down.

MACHINE FOR SEPARATING ORES.—S. T. Pearce, New York city.—This invention consists of an arrangement of means whereby the granulated and sized substance to be acted upon, being discharged upon the surface of a cone of polished metal under rotary motion upon its vertical axis, will be set into motion by the contact of the same with the cone, and discharged therefrom in various lines, governed by the specific gravity of the particles and the frictional quality of the same, in a manner to fall into various receptacles arranged with reference to the various positions in which the particles all fall, to separate them in the order of their falling.

STAND FOR MUSKETO NETS.—A. Strasser, and B. M. Lewy, Montgomery, Ala.—This invention consists of a frame in the form of a parachute suspended from the top of an adjustable support rising up from a stand or table, and susceptable of adjustment, either to a verticle or inclined position, on which the musketo net is suspended.

TANNING.—W. Windoes, Fond-du-lac, Wis.—This is a new and economical invention by means of which a very soft and beautiful leather may be expeditiously produced with great success. We have examined some excellent specimens of the leather, in fact we are using gloves made of it which are admirable in quality. We regard the improvement as one of value. The process is quite simple, and reflects credit upon the inventor.

GAGE FOR MEASURING HOLES FOR KEYS.—Benj. F. Merrill, West Lebanon, N. H.—This invention consists in a gage made of two pieces of wood or metal, united together by any adjustable connection, the general form of which, when so united, resembles to some extent a key as ordinarily constructed for securing a wheel to a shaft or the parts of a connecting rod and cut together; which may be inserted in a key hole and adjusted to the proper angle to fit the two inclined sides of the same, when the parts may be secured in that position and removed from the key hole after which the measurement may be readily taken to form the key to fit the said hole.

STEAM VALVES AND VALVE MOTION.—L. H. Allen and John B. Wilford, Tamaqua, Pa.—This invention relates to an improvement in sliding steam valves, and to the method in which they are operated, and it consists in forming the valve with bars for covering the exhaust parts and in moving the valve by steam from the main cylinder operating in an auxiliary cylinder.

DOUBLE ACTING SUCTION PUMP.—Patrick Foley, Nineveh, N. Y.—This invention relates to a new pump, of that class in which two vertical cylinders with reciprocating pistons are used, and which are generally employed for raising water from deep and other wells. It consists chiefly in a novel arrangement of valves, whereby the connections of the eduction and discharge pipes with the cylinders are closed; said valves being so arranged that, when the pump is not to be used, they can be opened to discharge all the water from the cylinders, so that the freezing of the water within the pump or its pipes is completely avoided.

CHURN DASHERS.—T. W. Tyler, Corry, Penn.—This invention has for its object to furnish an improved churn dasher which shall be so constructed as to bring the butter quicker, with less labor, and in larger quantities than the dashers now in use, and which shall, at the same time, be easily washed and cleaned.

DUMPING CARTS AND WAGONS.—William W. Rogers, Hampden Corner, Me.—This invention has for its object to furnish an improved device by means of which the tail boards of dumping carts and wagons may be made self-operating—that is to say, so that the tail board will be raised automatically, as the cart or wagon body is tipped up to dump the load, and will drop back into place and fasten itself as the said body is again raised into a horizontal position.

TIRE COOLER.—John Wampach, Shakopee, Minn.—This invention has for its object to so improve the construction of tire frames that the tire when set may be instantly cooled before it can injure the felloes, and without wasting the water, which is an important consideration where water is scarce and has to be brought from a distance.

SHEAR RUDDER BOOM.—Levi W. Pond, Eau Claire, Wis.—This invention has for its object to furnish an improved boom which shall be so constructed and arranged that it may be held in any place to stop the floating lumber, and opend and closed when required by the action of the current of the stream.

CHURN.—D. A. Fiske, Delaven, Wis.—This invention has for its object to improve the construction of the dasher so as to make it more easily worked and more efficient in bringing the butter; and to improve the construction of the cover so as to prevent the escape of the cream while the churn is being operated,

WEATHER-BOARD GAGE AND MEASURE.—Isaac Williams, Westfield, Ind.—This invention has for its object to furnish an improved instrument simple in construction and easily and quickly adjusted, by means of which the exact length of the space between the window frames and other places may be conveniently and quickly measured, in such a way that the board when marked and sawed off may exactly fit into the desired space without its being necessary to use the plane upon the ends of said board to make it fit, and which shall be equally applicable for other similar uses.

WEATHER-BOARD, GAGE AND REST.—Isaac Williams, Westfield, Ind.—This invention has for its object to furnish an instrument to gage the distance apart of the edges of the weather boards and at the same time to support the board while being nailed on, so as to avoid the necessity of driving in nails to support each board, as is now the practice, economizing time and labor.

BUNDLING MACHINE.—Edward J. Reddy. Bayville, N. Y.—This invention has for its object to furnish and improved machine designed expressly for bunching or bundling asparagus and other vegetables, to be put up in bundles or bunches, and which shall at the same time be simple in construction and easily operated.

CARRIAGE TOP.—J. F. Sargent, North Tumbridge, Vt.—This invention has for its object to furnish an improved carriage top, which shall be so arranged that it may easily and quickly attached and to detached from the seat and when detached may be so closed as to occupy a very small space.

CAR COUPLING.—Clinton R. Hardy, Lexington. Ind.—This invention has for its object, to furnish a simple convenient strong, safe and reliable car coupling, which shall at the same time be so constructed and arranged as to uncouple itself should one or more cars of the train be overturned or thrown from the track.

COMPOSITION FOR DESTROYING INSECTS UPON HOP VINES AND OTHER PLANTS.—W. A. Phillips, Perry Center, N. Y.—This invention has for its object to furnish an improved composition for destroying lice and other insects upon hop vines and other plants, which shall be composed of ingredients easily obtained, prepared and applied, and which shall at the same time be effectual in accomplishing its object, and harmless to the vines or plants.

CHEESE VAT.—Paschal Colvin, Peccatoniea, Ill.—The object of this invention is to provide an apparatus which will accomplish the formation and manipulation of cheese curds in an effective and economical manner. Patented July 28, 1868.

FIRE AND WATER-PROOF CEMENT.—Snow and Hunkins, Macon, Missouri.—This invention relates to a new and useful cement which is adapted to various uses when the action of fire or water is to be resisted. Patented July 28, 1868.

CEMENT BRANCH PIPE.—Enoch Lockhart and Frank Roberts, Louisville, Ky., and Henry Knight, Brooklyn, N. Y. This invention relates to an improvement in the manufacture of brauch pipes for water conductors in drains or sewers, and for other purposes, and it consists in the peculiar formation of the mold and the cores, and the manner in which the cores are united and secured in place, and the method of using the same. Patented July 28, 1868.

SHORES FOR RAISING HOUSE FRAMES.—J. W. Glover, Wm. B. Orner and B. E. Orner, Martinsville, Ind.—The object of this invention is to accomplish the raising of house frames with a small number of persons. It consists of two or more toothed shores in combination with saddles, to be set on to the upper tie-beams of the "bents," so-called, and which accomplish the raising of the bents by the reciprocating action of the shores. Patented July 28, 1868.

GRAIN REGISTERING MACHINE.—Barnett Taylor, Forestville, Minn.—The object of this invention is to accomplish the registering of grain automatically. It consists of a box provided with a yielding top which is actuated downward by the weight of a measure of grain, the top being connected with suitable mechanism to register the number of times the top is so depressed. Patented July 28. 1868.

HAT HOLDER.—Z. Waters, Bloomington, Ill.—The object of this invention is to provide a means for holding hats, and locking the same in such a manner that none but the person having the key to the lock, can take it from the rack. It is particularly designed for hotels, steamboats, and public halls, to prevent those mistakes in taking hats from racks, which mistakes are generally annoying and disadvantageous to one of the parties concerned, and will save hotel keepers and other persons who are responsible for the loss of hats, a great deal of expense in replacing stolen hats. Patented July 28, 1868.

VEGETABLE GRATER.—E. A. Goodes, Philadelphia, Pa.—The object of this invention is to provide a machine for grating vegetables in an expeditious and easy manner. It consists of a case containing a grating cylinder of punched sheet metal, or other suitable substitution therefor, and arranged in such a manner that the vegetables will be brought in contact with the grating cylinder, and the grated particles permitted to fall below into any suitable receptacle. Patented July 28, 1868.

PAPER CAP.—G. Imbach and J. Weidenman, Hartford. Conn.—The object of this invention is to furnish a cap or hat of paper, or other equally light cheap material, having the crown and band in two distinct parts, whereby the former can be removed when soiled, and another substituted. Patented July 28, 1868.

SUBSOIL ATTACHMENT FOR PLOW.—J. C. Leonard, and J. J. Gobar, Clinton, Mo.—This invention consists of an auxiliary plow so constructed as to be attached in rear of a common sod or other plow. Patented July 28, 1868.

Business and Personal.

The charge for insertion under this head is one dollar a line.

Manufacturers of skate materials please address E. D. Tracy, Sterling, Ill.

Makers of potato diggers and agricultural machines send circulars to G. E. Carleton, Colebrook, N. H.

Anderson Bro's will contract to do lathe work at their machine works, Peekskill, N. Y.

Manufacturers of cider mills will please send circulars and address to F. R. Burnham, Rushville, Yates county, N. Y.

E. J. Hatch, Eaton, N. Y., wishes to know the construction, capacity, and peculiarities of the Jonval turbine.

For sale—A part of a patent right now in successful operation, manufactured by Haas & Co., patentees, Nos. 25 and 27, Haydock st., Philadelphia, Pa., whom address for further particulars.

Wanted—clear white birch wood, Higel & Hirst, 1126 Cholotta st., Philadelphia.

J. H. & N. A. Williams, Utica, N. Y., make the best patent sweet fern and chemical lacing that has been put in market. It has great strength, and is of very superior quality.

If D. H. Carpenter, patentee of a gas machine, etc., will address Daniel H. Carpenter, 39 Bethune st., New York, he will hear of something to his advantage.

Foundery and machine shop for sale, with engine, boiler, shafting, etc., all complete, located on the N. Y. & E. R R; coal, iron, lumber, and labor very low. Suitable for any class of manufacturing. Enquire of, or address J. A. P. Porter, 15 Cortlandt st., New York.

Information is wanted concerning steam plows—address of inventors and makers, statements of the work they will do, where they have been successfully employed, sizes, prices, number of men required to operate, and all particulars in full. Address Louis Haas, Stockton, Cal.

For sale—the patent right, in Great Britain, for perforated saws. The manufacture of these saws is now firmly established in the United States, and they are rapidly taking the place of all solid saws. Apply to J. E. Emerson, Trenton, N. J.

Peck's patent drop press. For circulars, address the sole manufacturers, Milo Peck & Co., New Haven, Conn.

Send for description of Huntoon governor on entirely new principles. 103 State st., Boston, or 79 Liberty st., New York.

Bolt-heading machine just finished and ready for operation. May be seen at McLagan & Stevens', New Haven, Conn.

For descriptive circular of the best grate bar in use, address Hutchinson & Laurence, No. 8 Dey st., New York.

Millstone-dressing diamond machine, simple, effective, and durable. Also, Glazier's diamonds, diamond drills, tools for mining, and other purposes. Send stamp for circular. J. Dickinson, 64 Nassau st., N. Y.

Prang's American chromos for sale at all respectable art stores. Catalogues mailed free by L. Prang & Co., Boston.

For breech-loading shot guns, address C. Parker, Meriden, Ct.

Winans' boiler powder (11 Wall st., N. Y.,) 12 years a standard article for preventing incrustations. Beware of imitations and pretended agents.

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Improvement in the Velocipede.

Within a few months the vehicle known as the velocipede has received an unusual degree of attention, especially in Paris, it having become in that city a very fashionable and favorite means of locomotion. To be sure the rider "works his passage," but the labor is less than that of walking, the time required to traverse a certain distance is not so much, while the exercise of the muscles is as healthful and invigorating. A few years ago, these vehicles were used merely as playthings for children, and it is only lately that their capabilities have been understood and acknowledged. Practice with these machines has been carried so far that offers of competitive trials of speed between them and horses on the race course have been made.

The engraving represents one used by the well known Hanlon Brothers in their public exhibitions, and has only two wheels, the vehicle being kept in an upright position while in motion by the skill of the rider. The power for propulsion is applied by the feet and the vehicle is steered by a lever worked by the hands, which is attached to the forked support of the forward wheel. The subjects of the Hanlons' patents are extension or adjustable cranks to suit the driver's peculiarities, an extensible seat, and its adaptation to the use of ladies by making it similar to a side saddle. The vehicle may have three wheels—a steering wheel in front and two supporting wheels in the rear of the occupant—in this form being better adapted to the use of women and children and to new beginners. The seat in this improved velocipede is a spring, being supported on flexible steel or wooden strips and insuring ease of motion. We are told that the capabilities of this machine are admirably exhibited by the Hanlon Brothers, some of their evolutions rivaling in grace and rapidity those of the best skaters.

The machines are built on this improved plan by Calvin Witty, carriage builder, 638 Broadway, New York. Patented July 7, 1868. For further particulars address Hanlon Brothers, 53 and 55 West 13th street, New York city.

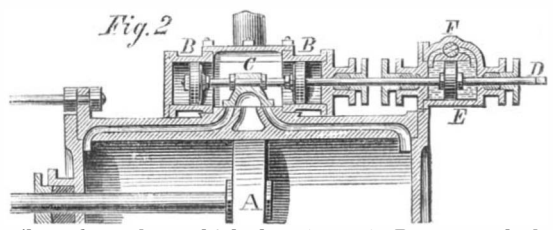
HANLONS' PATENT IMPROVED VELOCIPEDE.

Improvement in Double-acting Steam Pumps.

The object of this invention is to overcome difficulties, heretofore experienced, in the working of reciprocating steam pumps for raising water from deep mines, and in other situations where it is necessary to elevate water to a considerable hight. This object is sought to be accomplished by means of an auxiliary valve which, with its connections, operates and governs the main valve and the stroke of the piston, preventing all shock and jar at the end of the stroke.

Fig. 1 is a perspective view of the machine, in general appearance resembling the common steam pump, but having peculiar appurtenances for the purpose above stated. Fig. 2 is a sectional view of the most important of these appurtenances. They consist first, of an auxiliary steam chest on the side of the main steam chest, containing an auxiliary sliding valve covering the ports of passages leading from each end of the main steam chest, and an exhaust port connecting with the main exhaust. This valve is operated by the motion of the main steam piston, A, through the medium of a sliding bar on the outside of the steam cylinder, having its bearings in the flanges of the cylinder, and being provided with arms at each end, to which are connected parallel rods passing through stuffing boxes in the cylinder heads, and projecting far enough into the cylinder to be actuated by the piston as alternately it approaches either end of the stroke. This outside sliding bar has a cam slot which is connected to the rod of the auxiliary valve by means of a bell crank; one end of the crank engaging with the valve rod and the other, by means of a wrist, with the cam slot in the bar.

At each end of the main steam chest is a short cylinder, B, fitted with a piston, the two pistons as well as the main valve, C, being secured to a valve rod, D. As the main steam piston approaches the end of its stroke, the auxiliary valve is opened, admitting steam to one of the pistons in the auxiliary cylinders, B, and operating the main valve.

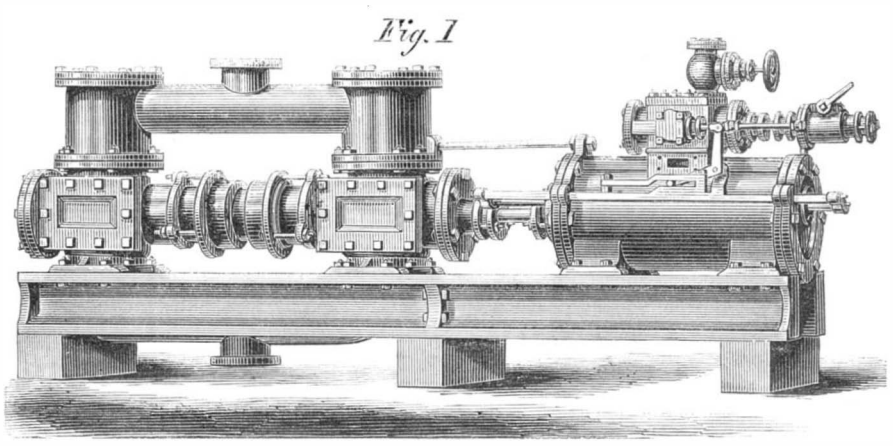


The valve rod to which the pistons in B are attached extends through an oil or water cylinder, E, in which is a solid piston secured to the rod and having, of course, the same stroke as those in B. This cylinder is filled with water, oil, or any other suitable liquid, and the ends are connected by a channel, F, providing a free passage from one side of the piston to the other. It will be seen that, as the piston in E moves, the liquid will be driven before it, if the passage is free, to the other end of the cylinder. But to govern this action there is introduced into the passage-way, F, a cock by which the movement of the liquid from one end to the other may be governed. If the passage is nearly closed by the cock, the obstructed liquid forms a cushion which receives the shock of the steam piston. The time employed in changing the liquid from one side to the other may be exactly regulated by means of the cock, F, which may be adjusted by hand, or automatically by mechanism connected to the governor of the engine. By this means complete control over the action of the steam piston is obtained, in accordance with the amount of work to be done and the speed of the pump. The movement of the auxiliary valve and pistons commences at a point far enough removed from the end of the stroke to allow of a gradual shutting off and admission of steam, producing an easy and uniform motion, without jar or shock at each end of the stroke.

The pump itself does not differ materially from the ordinary steam pump; it is a double-acting plunger pump familiar to engineers and machinists.

These pumps were introduced in the mining region about eighteen months ago, and have proved themselves the best yet tried for heavy lifts. There have been built and put in use some sixteen, varying in size from 6-inch plunger with 9-inch steam cylinder, 3 feet stroke, up to 16½-inch plunger with 38-inch steam cylinder 6 feet stroke, and working on lifts up to 400 feet vertical hight. In some cases the steam is carried over 1,500 feet. Their action is so smooth that they require no fastenings of any kinds, their own weight being sufficient to keep them perfectly steady. For these improvements one patent dated September 24th, 1867, was granted through the Scientific American Patent Agency, and another is now pending through the same agency.

For any further information or for pumps of any size, apply to Allison & Bannan, Franklin Iron Works, Port Carbon, Schuylkill County, Pa. Shop, County, or State rights for sale.



ALLISON'S STEAM PUMP AND GOVERNOR VALVE.

LETTERS are daily received at this office without the writers' signatures. We pay no attention to such communications—they are committed to the waste basket at once. Persons who write to us should always sign their names as a guarantee of good faith, and if their letters are intended for publication the writer's name need not be printed unless he so desires.

THE refusal of the Commissioner of Patents to extend the patent of the Union Paper Collar Company, has virtually terminated the protracted litigation between S. W. H. Ward and other paper-collar manufacturers, and that company.

The Railroad to the Pacific.

That the railroad now being built from Omaha, Nebraska, to San Francisco is one of the marvels of this age of great events, is a trite saying, but one whose truth is confirmed by every day's reports from "the front," where twenty thousand laborers are digging and laying the iron continental highway. We speak of "the front" and not of the "end," for the Union Pacific Railroad may be said to have but one end, and that one rests upon the banks of the Missouri. The other end is an indefinite point, a shifting spot in the surveyed route: here to-day and away beyond to-morrow. Where the last rail was laid a week ago is now a score of miles in the rear, and what is the further end of the track as we write will be miles behind the track-layers when these lines reach the eye of our readers. Let the figures of the past tell the story of what is being done in the present. Two years ago the Union Pacific Road had just started upon its way; last December 540 miles were completed and in running order. One hundred and twenty miles have been built since the frost was out of the ground this year, and 250 more miles will be finished before 1869, if we may believe the promises of the contractors, whose performances hitherto have not only equaled but exceeded their predictions. Then, with the completion of the promised 300 miles of the Central Pacific Road, now being vigorously pushed from the Pacific coast toward Salt Lake, there will remain a gap of not more than 600 miles to be built next year. With the record of past and present achievements before us, we may confidently believe the assurance of the managers of the Union Pacific, that this gap will be entirely closed in time for brothers and sons upon the Pacific coast to return to us by rail to eat their Christmas dinner in a year from the coming holiday time.

No text-books ever taught us so much concerning the western half of the American continent as the surveyors and builders of the Union Pacific have done and are doing. We have been accustomed to think of the Rocky Mountains as a series of impassable crags, frightful precipices, and unattainable cañons. The builders of this road have reached and crossed the summit at an elevation of 8,262 feet above sea level, without any grade greater than 90 feet to the mile, and that only for a short distance. What has been called the "Great American Desert" has been found to have such rich agricultural resources that Nebraska, which lies almost wholly within the confines of that supposititous "Desert," produces more wheat to the acre than any other State of the Union. That popular faith in this enterprise is strong is attested by the fact that the public has, within a little more than a year, invested more than $17,000,000 in its securities, and continue to look upon the bonds of this company as equaled only by Government's in all the elements of security and profit.—*Eclectic.*

Central Underground Railway.

It is announced that the subscription books of the Central Underground Railway Company, New York City, are now open at the office of Brown Brothers & Co. The Board of Directors comprises some of the best men in New York. The road is to be begun within a year and completed within five years according to the conditions of the Charter, and a pledge of $300,000 for the fulfilment of these terms, is to be deposited with the Comptroller. It is said that $1,200,000 are already guaranteed. The company intends to purchase and improve much of the property along the line of this road, and thus some portions of our city will doubtless receive a much-to-be-desired renovation. The route is to begin on the easterly line of Broadway, in City Hall Park, running underground in front of the City Hall, to Center street, to City Hall Place, under City Hall Place to Pearl street, across Pearl in a curved line to Mulberry, thence northerly under Mulberry to Bleecker street, across Bleecker to Astor Place, thence passing under Eighth and Ninth streets to Fourth avenue; continuing on under Union square and passing in a direct line to Madison square, under which it will pass to Madison avenue as now opened to Eighty-sixth street; continuing its course in a north-easterly direction to the Harlem river; thence easterly and westerly along the river until it reaches its terminus at the Harlem bridge.

Patents Not Wanted.

W. H. Higbee, of Trenton, N. J., whose letter appeared on page 83, wherein he stated that he would be glad of an opportunity to purchase an interest in a really good thing, writes to us to say that he has no desire at present to invest in a patent, and requests that letters to him on the subject may cease. Mr. Higbee informs us that his letter was not intended for publication; he supposed, at the time, that we had a list of patents for sale, which we had not.

Two of the cables for the new suspension bridge at Niagara Falls have already been stretched and attached to the anchorages. The others will shortly be thrown across.

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VOL. XIX., No. 8....[NEW SERIES.].... *Twenty-third Year.*

NEW YORK, WEDNESDAY, AUGUST 19, 1868.

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ROTARY AND RECIPROCATING ENGINES.

We are in receipt of several communications upon the relative value of rotary and reciprocating engines, and the supposed waste of power by the use of the crank while passing the center. In one instance we are asked to compute the precise "diameter of a rotary engine, that will equal in efficiency a reciprocating engine having an equal piston area, and a crank of given length." This question of loss of power by the crank is constantly recurring in one form or another, and we have so often discussed it in our columns that we think our views upon it should be well understood by those who have been for any considerable time readers of our paper. The attempt to substitute any other method than the crank, for changing a reciprocating motion into a rotary one, where any heavy work is to be done, has always resulted in a demonstration of the superiority of the crank. The latter is at the same time one of the most simple as well as one of the most beautiful of all mechanical movements. The notion that it wastes power is not founded upon fact, and we think we can make this perfectly plain to our correspondents.

Steam under a given pressure possesses a fixed amount of mechanical power for every unit of volume. The application of the pressure and expansive force of a given amount of steam through the entire revolution of a crank, provided it might be so applied, would not increase its working efficiency. The same amount applied to a portion of the revolution so that its entire efficiency should be used would produce the same result. Suppose a windlass to have a fly-wheel attached of sufficient weight to store up and to impart considerable more power than is required to raise the weight attached to it. Suppose further, that a power of 4 lbs. applied to the winch through its entire circuit is sufficient to raise the required weight. Then will a force of 16 lbs. applied successively through ¼ its revolution continuously raise the weight. In this case 12 lbs. of force are taken up by the fly-wheel and gradually expended in raising the weight through the three fourths of the revolution to which the power is not directly applied. In reciprocating engines the steam is applied only through a partial revolution, but enough is applied so that the surplus force absorbed by the fly-wheel, expended during the remainder of the semi-revolution through which the crank must pass, is sufficient to keep up the speed at the required rate. Therefore there is no loss of power, provided the parts of the engine are properly adjusted, and the steam is cut off at such a portion of the stroke that the full force of its expansion is realized. The steam in a reciprocating engine is applied while the connecting rod is nearly at a right angle with the crank; the fly-wheel transmits its store of force in a direction always at right angles with the crank; hence it is absurd to suppose that other devices having for their object the application of the steam in a direction uniformly at right angles with it, can possibly possess any great superiority over the crank and fly-wheel which does so very nearly the same thing.

Now a word in regard to rotary engines. If steam is applied to them only through the same fraction of a revolution that it is applied to reciprocating engines, we think there is no one who would suppose them superior to reciprocating engines. But if steam were applied only through one fourth of a revolution, twice during each revolution, it will take twice as much steam to supply it during the entire revolution. In the latter case more power would be obtained, but it would be at the expense of more steam. Hence we assert that a rotary steam engine having the same piston area as a reciprocating engine, properly constructed and manipulated, and its semi-diameter equal to the length of the crank, can never do more work in proportion to the steam used (leaving out of the question the slight disadvantage in the application of the power above alluded to), while on account of the imperfect use of the expansive force of the steam, it is less efficient. The account summed up would leave a balance in the favor of the latter.

IS MANUAL OR MECHANICAL LABOR EITHER DISHONORABLE OR UNPROFITABLE?

We shall take the negative of this question most decidedly; yet from the practice of most persons one would think that the facts were against that view. Even the most successful practical mechanics do not generally commend to their sons their own business, but, seeming to entertain some sort of an antipathy to mechanical labor and to have exalted notions of mental work, or employment involving but little outlay of physical force, strive to *elevate* their sons by placing them in a store, office, or some other place or position to which the idea of useful, hard work does not attach.

It may be that there is less hard work in employing the brain, almost exclusively, than in using the muscles, but the writer in an experience of forty and more years as common laborer, machinist, mechanical engineer, store and office clerk, school teacher, and writer has failed to discover the fact. Perhaps, also, anything or everything pays better than manual or mechanical labor, but that fact has not yet reached the apprehension of the writer. Clerks and even salesmen in stores, copying clerks in offices, the scribbling drudges of corporations, contributors to periodicals, etc., are among the poorest paid and hardest worked classes of the community. Beside this, they are frequently the "servants of servants," envying the independence of the "wood sawyer's clerk."

If wealth brings honor and position, surely the creator of the wealth need not be dishonored by his employment. It is absurd in this country, where there are no family estates held by laws of primogeniture or entailment to nurse a brood of loafers, where whoever *has* must first *get*, to talk of the ignobleness of labor. Our wealthiest—our best men—feel proud to have been the builders of their own prosperity, the arbiters of their own fate, the commanders of circumstances. Wealth acquired or competence obtained by hard, persistent, physical labor is valued and really enjoyed, because the very labor expended has given a zest for its enjoyment, and the knowledge that it is a deserved reward for persistent endeavor gives a conscious right to its possession.

As to the social disabilities often attributed to mechanics and laborers, much misapprehension exists. "Society," *par excellence*, is not confined either to the wealthy or the butterflies of fashion. As much intellect, as much education, as much general knowledge is to be found among our mechanics as among an equal number of our wealthy men. They form institutions for benevolence, for mutual education, for enjoyment, and carry them on successfully. They are among our most forcible debaters on religious, political, or social questions. Their contributions to the daily and weekly press are as potent in their influence as the carefully studied and elaborately constructed leaders of the professional editor. If their social world is theirs only, it will compare favorably with that of the "upper ten." No; the laboring classes are not low in the social scale. Indeed, not unfrequently they give a healthy tone to that so-called higher society which is continually recruited and sustained by members from their ranks. Physical labor, so far from being inimical to intellectual development, is one of the necessities of that development. Then, the workman (muscleman) is not to be pitied or commiserated, but rather to be envied. He is to be envied, because, first, he has an agreeable and healthy employment; second, because, whether reasonable or not, he has the stimulus of hope to achieve what he may consider a higher position—that of competence or affluence. His mind is engaged, his physical powers exercised, his health insured by congenial, constant, and useful employment.

Now as to the relative profit of manual labor and apparent work. While the salesman, clerk, or scribbler must be content with his two, three, or possibly four dollars per day, the mechanic can earn as much or more, even five dollars, with a feeling and knowledge of independence which the clerk can never experience. Still more, as this is a country where labor rather than rich patronage governs, the possessor of a good trade—the master of a useful business—can almost always not only find employment, but even dictate his terms. Such a man is truly independent. He knows that his two hands, guided by his educated brains, are sufficient to provide for him and his, and may possibly place him far above those who consider the "greasy mechanic" a fair subject for insane jests.

MINERAL AND ANIMAL AROMAS AS CONDUCIVE TO HEALTH.

A paper published in the heart of the Pennsylvania oil regions, the Titusville *Herald*, states that "sickness is comparatively unknown in our oil towns, the statistics showing a degree of health unequaled by that of any other portion of the country." Apropos to this it may be stated that petroleum vapor contains much of what is known as carbolic acid, a notable destroyer of the lower organisms and their germs. So we are told that the stench arising from partially putrified hides in a tannery is an antidote to diseases which are supposed to be conveyed, if not propagated, by the atmosphere and destructive to the infinitesimal germ of noxious matter contained in it. We have little faith in either of these statements. They may appear plausible from the fact that nobody who has any sensitive olfactory nerves can live in comfort under the influence of either of these noxious effluviæ. It has been suggested that Venango county, Pennsylvania, would be an excellent retreat for invalids on account of its presumed peculiar healthiness. It may be so, but if our experience of some two months in the oil region is a criterion we do not envy the invalid his sojourn in that delectable atmosphere.

THE PHYSICAL RESEARCHES OF THE AGE.

The physical researches of the present age seem to be devoted in a great degree to the two subjects of optics and acoustics, and some very novel and ingenious practical applications of the principles of these sciences have been made to mechanical engineering, the value of which remains to be demonstrated. The workers in these fields, at the head of whom must be ranked Dr. John Tyndall, have brought to bear an amount of labor and experiment that would scarcely be credited by our readers should we state it. Prof. Tyndall, in speaking of the amount of experiment made to determine the velocity of sound, says: "Those who are unacquainted with the details of scientific investigation have no idea of the amount of labor expended in the determination of those numbers upon which important calculations or inferences depend. They have no idea of the patience shown by a Berzelius in determining atomic weights; by a Regnault in determining the coefficients of expansion; or by a Joule in determining the mechanical equivalent of heat. There is a morality brought to bear upon such matters which, in point of severity is probably without a parallel in any other domain of intellectual action. The desire for anything but the truth must be absolutely annihilated; and to obtain perfect accuracy no labor must be shirked, no difficulty ignored. Thus, as regards the determination of the velocity of sound in air, hours might be filled with the simple statement of the efforts to establish it with precision." The relation of tension to pitch of sound was early established, but its application to the solution of engineering problems has, so far as we are aware, only been made within the present year. This application is due to Mr. W. Airy, who used it to determine the strains upon every one of the intermediate bars connecting the top and bottom members of what is known as the "bowstring bridge." These strains are due to the various arrangements of weights upon the bridge. It is obvious that this is a problem of great complexity, as a weight upon any given point is more or less distributed to other parts of the bridge, on account of its peculiarities of construction; a reaction of strains taking place throughout the entire structure. The problem is by no means indeterminate, although its solution would tax all the resources of mathematics.

It would almost seem at first thought that the sense of hearing would be the least liable to be applied successfully to the solution of such a problem; but the ingenuity of modern experimenters seems almost inexhaustible. Mr. Airy constructed a model of a bowstring girder having its intermediate ties of steel wire of uniform size. By loading a wire of the same size and length of any particular tie, with weights, until its tone was in unison with the tie, the weight would of course be equal to the strain which produced the same tension in the tie. This experiment, which seems to have given very satisfactory results, will no doubt lead to similar tests upon more complicated structures, which present such severe problems of construction that anything more than an approximate determination of the strains to which their different parts are subjected, is by mathematical means not to be expected.

In the science of optics we notice the announcement of the invention of a new photometer, which gives most accurate measurements of the intensities of luminous rays. The delicacy of the instrument is so great that Mr. Crookes, who perfected it, announces that it will indicate a difference of intensity caused by moving a lamp one tenth of an inch. The description of this instrument may perhaps be given in a future article.

In chemistry much is being accomplished. The complex substance called neurine, which is a large constituent of the brain and nerves, has been synthetically produced. Inorganic chemistry is attracting increased attention, and theoretical chemistry is receiving a new impulse from the labors of Sir Benjamin Brodie and the discussions arising from the publication of his late work, the "Chemical Calculus."

In physiology, Pettenkofer and Voit, with the celebrated respiration apparatus, at Munich, are throwing light upon the mystery of sleep, by showing that animals during sleep store up oxygen.

To the sciences of geology, paleontology, and microscopy many important additions have been recently made, which we cannot now allude to in detail, while in the other sciences which we have forborne to mention, the march of intellect keeps step with the general progress of the age. Would that we might also add that the moral progress of the world was also in keeping with its advances in knowledge.

OBITUARY.--GEN. CHARLES G. HALPINE.

General Halpine, known under his *nom de plume* as "Miles O'Reilly," died suddenly at the Astor House, New York city, Aug. 3d, from an overdose of chloroform administered by himself while suffering from illness. He occupied the positions of city register and chief editor of the *Citizen*. As an official he was capable, honest, efficient; as a writer, energetic, terse, vigorous, and talented. Socially he was generous, genial, and honorable. General Halpine was born and educated in Ireland. He came to this country in 1851. When our civil war broke out he went to the field as second lieutenant and rose successively through the different grades to the rank of Brevet Major General. His death at the early age of 39 is regretted by a large circle of friends and acquaintances and by the public at large.

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TASTE AND SMELL UTILIZED.

The two senses of tasting and smelling are usually considered mainly as servants, capable of contributing to our luxurious pleasures, rather than as aids to business success; yet some departments of business could hardly be conducted without their employment. The sale and purchase of liquors and wines are consummated almost entirely by the help of taste and smell. Although the strength may be judged by the size and appearance of bubbles formed when shaken, by the sinking or floating of olive oil in them, and their appearance when turned, yet the expert judges more readily and correctly of their strength, as well as purity, flavor, etc., by tasting and smelling. In the great wine marts of Europe the business of wine taster is a distinct profession. Tobacco and hops are judged by the purchaser fully as much by smell as by sight and touch; and it is wonderful what expertness is attained by professional judges by the cultivation of this sense; their judgment being practically infallible.

But the testing of tea exhibits, in a more marked manner, the use of taste and smell in mercantile transactions. In every wholesale tea house will be found a row of tea cups with a little furnace or lamp for heating water. There is no sugar or milk. In the side of every chest of tea, ranged in tiers along the walls, is a small hole stopped by a cork. The taster draws the cork, takes a few grains of tea in his hand, smells it, then puts it in a cup, pours a little hot water on it, tastes, and his judgment is formed, the character of the tea is fixed. Frequently the smelling is sufficient, and it is remarkable how absolutely and decidedly the professional taster declares the character of the article he has tasted. Not less remarkable is the fact that there is seldom any marked disagreement between the estimates made by different individuals. The profession of tea taster in our large cities is frequently quite lucrative. Merchants purchase largely, relying implicitly on the representations of the expert; and it is seldom their confidence is misplaced, whatever "tricks of the trade" there may be attempted to deceive the taster.

The gift, if so it may be called, of being a successful tea taster, is not general, although it might be supposed that experience would be all that is necessary to insure perfection, or at least an approximation to it. The profession is severely taxing to the nervous system, affecting the subject similarly to alcohol or tobacco when used to excess.

Submarine Perambulation.

The *Nouvelliste* of Marseilles gives a very minute account of the system employed there for working under water. Fulton, it informs us, was the first to solve the problem of a submarine vessel, which he built of copper for purposes of naval warfare, but was obliged to give up the plan because of the difficulty of supplying the men with air, especially when they were to operate at a distance from the apparatus; and, moreover, his method of propulsion was defective, consisting of jointed oars that could not afford a greater speed than 400 yard per hour. At present many ways have been devised for removing those obstacles. The air is supplied by a mechanical and chemical process combined. Before the vessel is let down a provision of compressed air is secured by means of pumps, and distributed among the various compartments; it is calculated to balance the pressure of the column of water she is to encounter at the depth required. The immersion of the submarine boat is obtained by increasing her specific weight through the introduction of water into its reservoirs; the immersion is effected by the expulsion of this water, which latter therefore acts as a moveable ballast. The boat's center of gravity is so arranged as to make her touch the bottom with her base flat, and almost without a shock. When the ground has not been explored before, the vessel is kept in suspension until, by a skillful manœuvre, a proper place is found for her. By ingenious contrivances an exact equilibrium is obtained between the compressed air and the column of water, and the trap doors communicating with the bed of the sea are then opened. The men, standing with their feet on the latter, but having their heads still in the chamber containing their supply of air carry the boat to the spot they want to explore; but if they find it necessary to leave the craft, each puts on his scapbander, or water tight helmet, provided with a hose, through which he receives air from the vessel, and which is screwed to one of the reservoirs of compressed air, and can thus work at a tolerable distance from the boat.

Editorial Summary.

A SPLENDID BEQUEST.—It is understood in private circles, that Henry Keep, Esq., of this city, whose name is very prominent in the railroad interests, has purchased the block of ground on the Fifth avenue, opposite the Roman Catholic Orphan Asylum, consisting of twelve city lots, whereon he proposes to erect, at his own expense, and for the benefit of the city, an elegant art gallery. The price paid for the ground is $260,000, and it is understood that Mr. Keep will expend nearly a million of dollars upon the building. Mr. Keep began life a poor boy, and as a reward for his energy and integrity he has amassed a large fortune, and now proposes to spend some portion of it for the good of the people. The particulars of this noble bequest have not yet been made public.

THE atmosphere in the tunnels of the Metropolitan Railway in London is reported to be absolutely poisonous, and without any sufficient cause, as their proper ventilation is perfectly practicable. Several deaths are reported as having occurred in these neglected passages, and the compulsory purchase of the road by the Government is loudly demanded by some of the English journals.

SMOKY CHIMNEYS.—A correspondent of the *Builder* submits a simple and cheap remedy for smoky flues, which is stated to be successful in eight out of ten bad chimneys. The principle upon which it depends is sound, and its use would obviate, in many instances, the employment of the unsightly chimney-tops which so often mar the architectural effect of otherwise fine buildings, without answering the desired end. He says: "I find from experience that, by the use of fine wire gauze of from thirty-six to forty wires to the inch, as a screen, blower, or guard, judiciously applied to register stones, ranges, or stove doors, little if any smoke will come into the room. The atmospheric pressure prevents the smoke entering the room through the gauze, and if applied immediately to the front of the fire more smoke will be consumed than by any other means. In that case the wire should be kept two inches from immediate contact with the hot fire."

HOW NOT TO STRAIGHTEN CURLY HAIR.—Two different applications for patents were lately made for compounds, claimed to take the natural curl out of the hair of negroes and make it straight. In one of the compounds, the chief ingredient was extract of Iceland moss, and in the other nitric acid $N O_5$. It was proved by actual experiment, to the satisfaction of the examiner that neither of these compounds would accomplish the result, and the claims were refused. Evidently the applicants only wanted patents as a recommendation to induce as many colored people as possible to try a bottle of the worthless stuff. Indeed, if every colored woman in the United States would only spend fifty cents to buy the remedy, being persuaded to do so by the recommendation of a United States patent, the patentees would make a nice little fortune. The result of these applications shows the value of a preliminary investigation into the merits of alleged new discoveries.

THE enterprising city of Chicago is to have a grand park, to be located on the Riverside Farm, about seven miles out of the city, and known as the Gage property—owned by D. A. Gage, of the Sherman House, embracing about eleven hundred acres, and to be connected to the city by a broad boulevard. The park is to be laid out in winding avenues for drives, and the grounds will be offered by the proprietors as sites for the erection of suburban residences. This strikes us as a very sensible project, and the natural advantages of Chicago will place the proposed park within easy access of those who seek for rural beauty and homestead enjoyment.

WOODEN PARASOLS.—The wooden parasols which were introduced extensively in the French capital and will likely find patrons in other fashionable centers, may thus be described: They are painted to represent peacocks' feathers, each feather being a separate rib, like those of a fan. By ingenious mechanism they can be fastened into the form of a parasol, and can also be folded up into as small a compass as a fan, which purpose they answer admirably. They also can be turned into a variety of things, and have joints by which they shade the wearer on any side where the sun is too powerful.

THE Abyssinian King—Theodore—wished his captains to attack the British by night, but preferring to meet death by daylight they declined the proposition. Had they accepted, it is doubtful whether they would not have been put to rout without a single shot, by the magnesium light Sir Robert Napier carried with him on the expedition. Had they stood their ground in face of the blaze of light thrown directly in their faces from a distance of 600 yards, the English shielded by the night could have picked them off at their leisure.

THE first Northwestern Woolen Exposition and Convention of Wool Growers and Manufacturers at Chicago, opened August 4th. It promises to be interesting. Mr. W. G. Coulter, in his speech during the second day's proceedings, stated that the superior facilities possessed by Western woolen manufacturers were nearly 25 per cent. in their favor over those possessed by the New England States. Fifteen hundred different lots of goods are on view, and many distinguished agriculturalists, wool growers, and manufacturers are present.

A CORRESPONDENT from Franklin, N.Y., sent, some days ago, a communication in regard to some reports heard by many individuals in that locality. By some mischance the communication was mislaid. The explosions occurred at a time when the sky was cloudless, and we learn from a second communication that they have been ascribed to the falling of a meteor. The reports were so loud in some cases as to severely jar houses and cause dishes to rattle, etc.

THE *Revue Populaire*, of Paris, gives an account of some very curious experiments made by Dr. Claude Bernard. If oxygenized blood be injected into the arteries of the neck immediately after decapitation, warmth and sensibility return, the eye gets animated and displays such perception that an object shaken before it will cause winking of the eyelids and movements of eyeballs as though to avoid injury.

THE dwellings found at the bottom of the fresh water lochs in Scotland continue to be discovered in various parts of the country and are attracting great attention, as throwing light upon the habits and history of the Celtic race which for many centuries inhabited that country. The first one was brought to light by the draining of a loch on the property of the late Mr. F. D. P. Asley, in Arisaig.

RUSSIA will soon have the Black Sea and the Baltic in direct railway connection. This was a long contemplated project, and will not only develop her commerce but enormously increase her defensive power.

WE are in receipt of several communications requesting information in regard to the spectroscope and spectral analysis. A full description of the instrument and its use, with engravings is to be found upon pages 17 and 18, Vol. XV. of the SCIENTIFIC AMERICAN.

THE Commissioner of Patents has extended the patent of M. A. C. Mellier, of Paris, for making straw paper. It is a chemical process for reducing straw and other vegetable matter to pulp by the application of a solution of hydrate of soda, also in the employment of hypochlorites in the process of bleaching. It is said to be a valuable invention.

MONEY PACKAGES.—Persons who send money to this office by Express, should always enclose a letter in the envelope along with the money. We frequently receive packages without the accompanying letter and are sometimes bothered to know who sent it. A letter would save time and trouble.

ANOTHER victim to science has fallen on African soil. Le Saint, the geographer, who had left France about nineteen months ago, has died at Abu Khaka. Malte-Brun has received letters from Alexandria which leave no doubt as to the young traveler's fate.

CYRUS W. FIELD telegraphed from London, August 3d, that the Atlantic cable of 1866 ceased to work about thirty-five minutes past twelve o'clock on that day. The damage is at the Newfoundland side, according to the tests, and is supposed to have been caused by an iceberg.

A PETITION signed by four hundred ladies has been presented to the Russian Minister of Public Instruction, praying that the Professors at the University might give special lectures for ladies, so as to satisfy their legitimate desire for higher instruction.

A SPINNING wheel made in the year 1768, and in good preservation, was recently sold in Lancaster, Pa., for ten cents, we should think that a poor compliment to the old family friend.

OFFICIAL REPORT OF PATENTS AND CLAIMS

Issued by the United States Patent Office,

FOR THE WEEK ENDING AUGUST 5, 1868.

Reported Officially for the Scientific American.

PATENTS ARE GRANTED FOR SEVENTEEN YEARS, the following being a schedule of fees:—

On filing each Caveat	$10
On filing each application for a Patent, except for a design	$15
On issuing each original Patent	$20
On appeal to Commissioner of Patents	$20
On application for Reissue	$30
On application for Extension of Patent	$50
On granting the Extension	$50
On filing a Disclaimer	$10
On filing application for Design (three and a half years)	$10
On filing application for Design (seven years)	$15
On filing application for Design (fourteen years)	$30

In addition to which there are some small revenue-stamp taxes. Residents of Canada and Nova Scotia pay $500 on application.

☞ *Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required, and much other information useful to Inventors, may be had gratis by addressing MUNN & CO., Publishers of the Scientific American, New York.*

80,529.—YARN-BEAM FOR LOOM.—Benjamin A. Bailey (assignor to himself and William H. Kilvert), Lewiston, Me.

I claim, 1st, The serrated keys and key-seats, for holding the head in position, substantially as set forth.

2d, A yarn beam, having main heads, made movable and adjustable, in combination with serrated key seats and adjustable keys, substantially as described.

80,530.—ELEVATED RAILWAY.—Eli M. Barnum, N. Y. city.

I claim, 1st, The construction and arrangement of the supporting columns of three plates, two outside corrugated plates joined upon a third central plate, arranged substantially as described.

2d, The construction and arrangement of the base block of the columns, substantially in the manner described with a nearing in the top and bottom thereof, the bottom nearing being fitted with keys, by which the column can be adjusted to a vertical position after the base or foundation block has been set, and without disturbing the same, the upper bearing acting as a fulcrum, by which the keys in the bottom bearing bring the tops of the columns to their proper position, in the manner substantially as described.

3d, In combination with the top of the columns, a separate cross-head, T, constructed, applied, and secured, substantially as described.

4th, Combining, between the wooden cross-tie, Q, and the iron cross-head, T, when constructed, the latter with a V-shaped top, and the former with a V-shaped bottom, the india-rubber bearing pieces, i i, inserted in the recesses cut in bottom of the cross-tie, so as to shed the water, and avoid the accumulation of ice and dirt around the rubber.

5th, The method and arrangement of securing the cross-tie and rail chair to the cross-head, substantially as described.

6th, Combining with the columns and rails of an elevated railway, a pipe or tube, for the purpose of supporting, sustaining, and bracing the same, substantially as described.

7th, In combination with the supporting columns, the adjustable brackets, u, figs. 6 and 6, for supporting the awning-rods t t, and by which they can be moved up or down, or attached to the inside or outside of the columns, substantially as described.

8th, In combination with an elevated railway, and as part of the system herein described, the construction and arrangement of the described signals to govern the movements of the cars, substantially as described.

80,531.—MACHINE FOR CUTTING RAGS.—Allan T. Bennett, and William O. Anderson, Cincinnati Ohio.

We claim the combination of the gang of hooked knives, C C1 C2 C3, arranged spirally along the shaft, so as to reach the material to be acted upon in rapid and regular succession, the notched bench, D, and yielding feed-wheels, E E1 E2 E3, all constructed as described, the knives working intermediately between the feed wheels and projections of bench, D, for the purpose set forth.

80,532.—COAL-STOVE.—David B. Cox, Troy, N. Y.

I claim the annular horizontally-circulating flue, b, around the base of the fire-pot, and separated from the chamber above by a perforated partition, g, substantially as and for the purpose herein specified.

80,533.—GOVERNOR FOR STEAM-ENGINE.—Christopher G. Cross Chicago, Ill.

I claim the arrangement of the lever or crank, T, beam, P, and pumps, N, with the cylinder, D, regulating stop, x y, shaft, E, rod, H, and case, A B, substantially as and for the purposes specified.

80,534.—LET-OFF FOR LOOM.—George Draper, Hopedale, Mass.

I claim the combination of the connection rod, l', or the mechanical equivalent thereof, with the lay, B, and the mechanism applied to the whip-roller, D, and the yarn beam, C, such mechanism consisting of the friction-strap, f, its wheel, g, and spring, d, and the operative lever and train of gears, as explained.

80,535.—APPARATUS FOR SWAGING THE SWIVEL-EYES OF WATCH-CHAINS.—Virgil Draper (assignor to Edmund J. Richards), North Attleboro Mass.

I claim the combination of the grooved supporter, A, the carrier B, the bed-die, D, the swaging die plate, E, and the punch, F, such being constructed for use in manner and for the purpose substantially as described.

80,536.—AUTOMATIC BOILER FEEDER.—Samuel Driver (assignor to Robert H. Driver), Philadelphia, Pa.

I claim the combination and arrangement of the chambers, B and B', and valves, G and G', provided with pinions, F1 and F2, and operated by means of the wheel, F, on the driving-shaft, D, substantially in the manner above described.

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80,537.—CUPOLA FURNACE.—John H. Eddy, Taunton, Mass.

1 claim, 1st, The air-chamber, I, when used in connection with cupola furnaces, as above described, and,

2d, The introduction of the blast into cupola furnaces, at the center thereof, whether the same is accomplished in the precise method herein described or by any other means substantially the same.

80,538.—WEATHER STRIP.—Thomas S. Fellows, Walnut Lake, Minn.

I claim a weather-strip, composed of the plates, C D, when the former is provided with a lip, c', and the latter with an acute-angular groove or recess, d', and the same are so combined and arranged that they are operated by the natural elasticity of the metal, substantially as described and for the purpose specified.

80,539.—REVERSIBLE LATCH.—Charles R. Fisher, Chelsea, Mass.

I claim, 1st, The slider or saddle, F, with the reversible bolt, C, and its spring, e, when combined and arranged as described, and so as to operate together as set forth.

2d, The combination of the carriage, D, the tumbler, E', and the retractile spring, E, with the saddle, F, the reversible bolt, C, and its spring, e, the whole being arranged and applied to the case, A, in manner as described, and so as to operate together as set forth.

80,540.—WASHING AND WRINGING-MACHINE.—George P. Fuller, Philadelphia, Pa.

I claim, 1st, The guiding-rings, D D, in combination with the heads, E E, and pressing-bars, C, substantially as described.

2d, The combination of the slides, d, with the pressing bars, C, and guiding-rings, D, substantially as described, and for the purpose specified.

2d, The combination of the slides, d, with the pressing-bars, C, and guiding-rings, D, substantially as described, and for the purpose specified.

3d, A revolving drum, which has around its periphery a series of squeezing bars, supported by springs, and having metallic slides on their ends, which are caused to vibrate in radial grooves in metallic rings, that are confined to the insides of the drum heads, when the several parts are constructed and arranged in relation to each other substantially as described, and the drum is combined and arranged with a series of squeezing rollers, substantially in the manner and for the purpose set forth.

4th, The combination of the segmental strips, k, with the dovetail grooves or recesses, l, and rollers, G, substantially as and for the purpose specified.

5th, The combination of the wringing apparatus, consisting of the squeezing roller, I I, carrying roller, 12, and endless apron, J, and chains, K, with the washing-machine, substantially in the manner described.

6th, The combination and arrangement of the shifter, consisting of the clutch wheel, O, lever, P, and horizontal rod, Q, with the driving-shaft, F, and wheel, L, substantially as and for the purpose set forth,

80,541.—MACHINE FOR THRESHING AND CLEANING GRAIN.—Henry Gill, Mansfield, Ohio.

I claim, 1st, the picker roll, C, in combination with the parts, a and b, when constructed and arranged to operate substantially as and for the purpose set forth.

2d, The beater or shaker arms, F, in combination with the roller, D, provided with the cams or tappets, e, for more thoroughly shaking up the straw and separating the grain therefrom, substantially as described.

3d, The straw-carrier, consisting of the belts, E, provided with spikes or teeth, and the notched bars, R, when arranged to operate substantially as shown and described.

4th, The adjustable tail-piece, G, in combination with the belts, E, substantially as described.

5th, The shoe, I, when located in a threshing machine, and pivoted at its front end, in front of the axle of the threshing cylinder, substantially as set forth.

6th, Providing the shoe, I, with the adjustable slide, h, for regulating the delivery of the grain and chaff to the blast in a thin and even sheet, as set forth.

7th, The combination of the float p, and the registers, V, when applied to a fan, and arranged to operate substantially as described.

8th, Operating the screw, n, by means of the springs, a', and the arms, f, and cams, n, when arranged as set forth.

9th, The combination of the shoe, I, inclined chute or grain board, H, and operating cams, n, when arranged for joint operation, substantially as described.

80,542.—CHEMICAL FIRE-ENGINE.—Edwin Gordon, Boston, Mass.

I claim, 1st, The combination in a chemical fire-engine, of chamber, A, rod, D, supplied with rings or conical shaped disks, E, or other equivalent measuring or graduating device, suction pump, C, compartment, B, sieve, F, pipe, a, and compartment, e, operating together substantially as and for the purposes explained.

2d, The combination, in a chemical fire-engine, of chamber, A, rod, D, supplied with rings, conical disks, or other measuring or graduating device, suction pump, C, compartment, B, and sieve, F, operating together substantially as above described, and for the purposes above set forth.

3d, The combination, in a chemical fire-engine, of the upper part of the chamber, A, or any equivalent, for holding chemical substances for generating carbonic acid gas, with the pump-rod, D, supplied with rings or disks, or any equivalent measuring or graduating device, and the suction pump, C, or any equivalent, for supplying a graduated quantity of pure water, operating together substantially as above described, and for the purposes therein stated

4th, The rod of a force pump, or other expelling pump of a chemical fire-engine so constructed that it shall extend above the piston chamber of said pump, and have upon it a succession of rings or conical disks or other equivalent measuring or graduating-device, for carrying down from a chamber above, through which the rod travels, a definite and regular quantity of some chemical substance or substances, for generating or assisting in generating carbonic acid gas, substantially in the manner above specified.

5th, A suction pump so arranged that it shall furnish a regular measured supply of pure water proportionate to the amount of chemical substances used and varying with the speed with which the engine is worked, for the purpose of dissolving and mixing with the chemical substances used for generating carbonic acid gas in a chemical fire engine, substantially in the manner and for the purpose specified above.

80,543.—STEAM-GENERATOR.—Joseph Harrison, Jr., Philadelphia, Pa.

I claim, 1st, Compensating units, e, combined substantially in the manner and for the purpose described, with a steam boiler constructed in accordance with that described in the patent granted to me, October 4, 1859.

2d, The combination of plain cast or wrought iron pipes with the cast-iron units, in the manner and for the purpose specified.

80,544.—COMPOSITION FOR PREVENTING INCRUSTATION IN STEAM BOILERS.—William Hewitt, Pimlico, England.

I claim the use of tannic acid, in combination with unctuous animal matter, in a solid form, for the purpose of preventing incrustation in steam boilers,

80,545.—TASSEL-FASTENING.—S. B. Hill (assignor to himself, Levi B. Taylor, and Charles B. Lang), Chicopee, Mass. Antedated July 18, 1868.

I claim connecting the bobbin, b, and cord, c, by means of the spring, a, substantially as described, and for the purpose specified.

80,546.—HANGERS FOR SHAFTING.—George W. Hubbard, and Scott A. Smith, Philadelphia, Pa.

I claim, 1st, The cored spaces, b', in combination with the enlarged opening, B, in a ball-and-socket hanger, when made for the purpose specified.

2d, The combination of the oil-reservoir, c'', in the lower adjusting screw, a' with the opening, o, and the channel, d', in a ball-and socket hanger, all constructed substantially as described, and for the purpose specified.

80,547.—RAILROAD GATE.—T. Romeyn Huntington, and William W. Huntington, Minneapolis, Minn.

We claim, 1st, The revolving lever, A, having, from end to end, a shoulder or groove, partly spiral and partly rectilinear, and so constructed that, when fastened upon the track alongside the rail, such shoulder or groove will receive the flange of the wheel, causing the lever to revolve, all substantially in the manner described.

2d, The combination of the rod and crank, I G, with the revolving lever, A, by means of short arm, J, so constructed and arranged that the train, passing over A, shall communicate a lifting force to rod, L, all substantially as described.

80,548.—TRUNK-CASTER FRAME.—George B. Jenkinson, Newark, N. J.

I claim, as a new article of manufacture, the within-described trunk-caster frame, formed with clamps, c c, braces, b b, and having the roller placed in the angle of the frame, for the purpose set forth.

80,549.—BOOT PROTECTOR.—J. U. Johnson, Springfield, Mass. Antedated July 24, 1868.

I claim, as an article of manufacture, the boot protector, constructed and arranged as described.

80,550.—STEAM HAMMER.—David Joy, Middlesboro, Great Britain, assignor to Gustav Brinkman, assignor to J. Vaughan Merrick, W. H. Merrick, and John E. Cope.

I claim the employment of the piston or hammer bar of a steam hammer or hammers, driven by elastic fluid, as the valve for the hammer, the ports being formed in the piston, hammer-bar, or cylinder, or among them conjointly substantially as set forth.

80,551.—WHIFFLE TREE.—J. W. Kelley, Cleveland, Ohio.

I claim the dove-tailed groove plate, C, in combination with the dove-tailed ribbed plate, F, in the manner as and for the purpose set forth.

80,552.—APPARATUS FOR WELDING TOGETHER THE LAY AND LAND SIDE OF A PLOW.—John Lane, Chicago, Ill.

I claim an improved implement for facilitating the welding together the lay and the land side of a plow, namely, a vise, the jaws of which are so shaped as to fit the curved surface of the lay and the under edge and inner side of the land side, substantially as shown and described.

80,553.—KNIFE RING.—Charles B. Long, and William A. N. Long, Worcester, Mass.

We claim the combination of the peculiar-shaped knife or cutter, b, with the slotted neck, a, c, p, B, and part, C, of the ring, substantially as and for the purposes set forth.

80,554.—FRUIT JAR.—J. B. Lyon, East Cleveland, Ohio.

I claim the screw tube, G, provided with notches, a, as arranged, in combination with the valve seat, D, valve, E, elastic band, H, and cover, B, for the purpose substantially as set forth.

80,555.—BOOT AND SHOE AND CLOG FOR THE FEET.—George W. Martin, Boston, Mass.

I claim, 1st, Uniting the two parts, A and B, of a boot or shoe heel by means of tongue and groove, h and g, when provided with self-adjusting retaining springs, c c, either with or without the spring, d, for the purposes specified.

2d, The tongue and groove, h and g, when formed with the receding sides, i i, and swelled sides, j j, when constructed and attached, as described, either with or without the projection, k, and openings, p p, as and for the purposes set forth.

3d, The elastic adjustable pieces, m and n, in use either upon heel or sole of boot or shoe, as specified and set forth.

4th, The tongue, h, and groove, g, in application to the heel of a boot or shoe, substantially in the manner illustrated, and for the purposes described and set forth.

80,556.—CULTIVATOR.—Robert McCorkell, Philadelphia, Pa. Antedated July 15, 1868.

I claim, 1st, The lever, H, rack, L, and connecting rod, N, in combination with the plates, E, for the purpose set forth.

2d, The lever, c, in combination with the drag bars, C, standard, n, and rubber spring, r.

3d, The mode of attaching and securing the head, b, of the drag bar, C, for the purpose of adjusting the angle of the plows.

4th, The mode of attaching and securing the standard, z, to the bar, y, as and for the purpose set forth.

80,557.—SPEAKING TRUMPET.—F. J. Miller, Brooklyn, N. Y.

I claim as a new article of manufacture, a pocket trumpet, made in substantially the manner described and shown, and for the purposes set forth.

80,558.—HEMMER FOR SEWING MACHINE.—John Morrison, Birmingham, England.

I claim, 1st, The hem folder, a, in combination with the graduated jointed arm, b, and horizontally-swinging base plate, c, substantially as and for the purposes herein shown and set forth.

2d, The combination, with the graduated arm, b, and base plate, c, of the spring slide, f f2 f3, constructed and used substantially as herein shown and described.

3d, The combination, with the hem-folder, a, graduated jointed arm, b, and base plate, c, of the spring plate, h h2 h3, jointed to the arm, b, at h4, substantially as and for the purposes set forth.

80,559.—OIL FOR WOOL.—William H. Moss, New Richmond, Ohio.

I claim the preparation of a compound oil, composed of the ingredients and in the proportions, and made in the way and manner, substantially as set forth above, for application to the use and manufacture of all kinds of woollen goods, and the greasing, carding, cleansing, and spinning of all kinds of wool.

80,560.—EXPANDING MANDREL.—Augustus F. Nagle, Providence, R. I.

I claim an expanding mandrel, as herein described, consisting of the slotted shell, B, having spring jaws, B B, and tapering arbor, A, all constructed, arranged, and operating in the manner set forth.

80,561.—BIRD CAGE.—Charles L. Osborn, New York city. Antedated July 20, 1868.

I claim, 1st, The combination, in a cage, of the sills, posts, plates, girts, cross ties, etc., constructed as described, with the glass sides, substantially as herein specified.

2d, The tent or sleeping compartment, J, constructed below the surface of the floor of the cage, substantially as described, when used for the purpose set forth.

80,562.—SPRING-SEAT FOR WAGONS.—Henry H. Palmer, Rockford, Ill.

I claim a seat, A, bottom, B, braces, C, and straps, E, in combination with the spring, D, when arranged to operate substantially in the manner herein described

80,563.—BUTTON.—Frederic J. Peabody, Medford, Mass.

I claim a stud or button, having its back or inner plate, B, divided on one side into two portions, b c, which are bent or curved around in opposite directions, so as to overlap each other, substantially in the manner and for the purpose set forth.

80,564.—MACHINE FOR POLISHING WOODEN HANDLES.—E. Quinlan, Sheboygan Falls, Wis.

I claim a hollow mandrel, A, with the burnishers, D D, attached thereto, substantially as and for the purpose set forth.

80,565.—ATTACHING HANDLES TO TOOLS.—George Raymond, Fitchburg, Mass., assignor to himself and Samuel E. Crocker.

I claim the combination, with the handle, its ferrule, and the tang or shank of the tool, of a tapering tubular key, passing through both the ferrule and handle, and encircling and grasping the end of the said shank or tang, under the arrangement and for operation as herein shown and set forth.

80,566.—WATER WHEEL.—Isaac S. Roland, Reading, Pa.

I claim the movable and self-relieving chute chamber, f j k l, located within the series of water wheel buckets, c c, and operating therewith, substantially as herein set forth.

Also, the arrangement of the movable chute chamber, f j k l, and its annular supporter, g, with the disk and buckets of the water wheel, substantially as herein set forth.

Also, the combination of the tubular gate, h, with said movable chute chamber, arranged and operating substantially as herein set forth.

80,567.—MOLD FOR CASTING LETTERS, ETC.—George F. Sack, New York city.

I claim a mold for casting letters and ornaments, which will retain an accurate impression of the most delicate lineaments of the pattern, made of a sepia or cuttle fish bone, in the manner substantially as herein described, and for the purpose mentioned.

80,568.—GAS-BURNER ATTACHMENT.—John Scholl, Soho, assignor to Samuel S. Bateson, Mayfair, England.

I claim, 1st, The combination with a platinum or other equivalent gas light improver or perfecter, of a guard or protector, for the purpose hereinbefore set forth.

2d, The peculiar modes of combining a gas light improver or perfecter with a guard or protector, whereby the former is maintained, through the agency of the latter, in its proper adjusted position, substantially as herein-before described, and illustrated by the drawings.

80,569.—HOISTING APPARATUS.—Elijah U. Scoville and Washington L. Scoville, Manlius N. Y.

We claim, 1st, The circular discharging-wedge, J, and roller, i, for operating the discharge of the transit pulley, A B, substantially as shown and described.

2d, The circular catch, k', and latch, M u, in connection with the transit-pulley A B, constructed and operating substantially as herein shown and described.

2d, The combination of retaining projections, e, with discharging levers, E, and hooked cheeks, a a'', of transit pulley, A, as herein shown and described.

80,570.—LIGHTING UP PICTURE GALLERIES.—Edgar M. Smith, New York city.

I claim a lighter, so constructed with dimmed plate glass underneath the burners, as that all that portion of a room or gallery above the line of vision shall be in bright light, and all that portion below the ordinary line of vision be in dim or obscured light, substantially as and for the purpose set forth.

Also, in combination with the dimmed plate glass, the bent rods and knobs, or their equivalents, for changing the light of the bright light, and the dimmed light in the room or gallery, substantially as and for the purpose described.

80,571.—MACHINE FOR GRINDING THE CUTTERS OF MOWING MACHINES.—Benjamin B. Snow and Theo. J. Dickerson, Auburn, N. Y.

We claim, 1st, The sliding rest, C, moving in a slot in the frame, for the purpose of holding the knife clamp, substantially as described.

2d, The rod, D, moving longitudinally in the rest, C, for the purpose of successively bringing the sections of the reaper knife to the stone.

3d, The combination of the clamp, E, and rod, D, with the rest, C, frame, A, and fixed stone, B, all arranged and operating substantially as described.

80,572.—HAND-SPINNING MACHINE.—W. H. Stevenson, Athens, Mo.

I claim, 1st, The rod, e, stud, m, levers, r v v' and t t', jaws, h h', step, s, and plate, w, of a spinning machine, all constructed, arranged, and operating in relation to one another and the other parts of the machine, substantially as and for the purpose specified.

2d, The rod, e, stud, m, lever, r, and its arm, 4, levers, n and q, with its connections, ratchets, 1 2 of a spinning machine, all constructed, arranged, and operating relatively to themselves and the other parts of the machine, as and for the purpose specified.

3d, The combination of the parts above mentioned with the frame, A, carriage, B, drum, C, belt, D, and roller, f, of a spinning machine, as and for the purpose specified.

80,573.—WATER BOSHES FOR PUDDLING FURNACE.—Joseph Stokes and John Brough, Trenton, N. J.

We claim making the boshes hollow, and the hollow to extend under the bottom for the passage of a current of water, substantially as and for the purpose set forth.

80,574.—GRATE BAR.—O. H. Taylor, Brooklyn, N. Y.

I claim, 1st, The grate bar, A, provided with serrations or indentions upon the upper slope of said bar, as herein shown and described, and for the purposes set forth.

2d, The key, D, in combination with the slots, F F, for the purpose of locking the bars, substantially as shown and described.

3d, The combination of the open truss work with the bar, A, provided with serrations, and interlocked by an independent key, when constructed as shown and described, and for the purpose set forth.

80,575.—FRICTION NIPPER.—D. Thomas, Hingham, Mass.

I claim, in friction-nipper feeds, the employment of a shoe in connection with the notched lever, cheeks and flanged ring, so as to operate substantially as described.

80,576.—TEA-KETTLE, COFFEE-POT, ETC.—W. Wagstaff, Millbury, Ohio.

I claim the transverse arrangement of the pipes, C, in the chamber, B, and in combination with the tea kettle or coffee-pot, A, in the manner as and for the purpose set forth.

80,577.—LAMP-WICK TRIMMER.—Daniel Warner, Boston, Mass., assignor to himself, James T. Bowman, Richard C. Dougherty, and Daniel J. Hinckins.

I claim the clamp gage, as constructed of the flat tube slitted at its opposite edges, as set forth.

Also, the combination and arrangement of either or both the flanges, c c, with the flat tube slitted at its opposite edges as specified, the whole being for the purpose or purposes as explained.

80,578.—HOP DRIER.—W. F. Waterhouse Weyauwega, Wis.

I claim, 1st, A furnace, with hopper-shaped interior, in combination with movable roof, D, substantially as described.

2d, The roof, D, hung by hinges at the eaves, so as to perform the threefold purpose of roof, for protection against the weather, as shown in Fig. 1, reflectors, to reflect artificial and solar heat, and to cover the kiln, to retain the heat when the hops are off, substantially as described.

80,579.—ROCK DRILLING MACHINE.—William Weiler, Washington, N. J.

I claim, 1st, The driving shaft, D, carrying at the opposite ends wheels F and F', and arranged on the frame of the machine, substantially as and for the purpose described.

2d, The yoke, G, secured to the top of the frame of the machine, for the purpose specified.

80,580.—APPLE PARER.—C. Albert Wiggin, North Sandwich, N. H.

I claim, 1st, The turn table, B, cogged as described, and furnished with projection, b, in combination with pinion, F, constructed and arranged to operate substantially as set forth.

2d, Shaft, b1, spring, D, pinion, F, table, B, shank, g, knife, G, springs, g1 and g2, fork, j, shaft, j', pinions, h and h', gear wheel, L, and shaft, f, all combined and arranged substantially as and for the purpose set forth.

80,581.—SCAFFOLDING.—Marvin T. Williams, Milwaukee, Wis., assignor to himself and John Lund.

I claim the two short ladders, A, pivoted to the bars, C, having the spring catches, D, arranged to engage in the recesses in the ends of bar, A, all constructed and arranged for use substantially as herein shown and described.

80,582.—ADJUSTABLE BARREL HEAD.—Andrew C. Yawger, Newark, N. J.

I claim the pieces, A and B, when used in connection with piece, C, of a barrel head, and held in place by means of piece, F, and screw, G, all constructed and operating substantially as set forth.

80,583.—SCREW DRIVER.—Isaac Allard (assignor to himself and Frank A. Howard), Belfast, Me.

I claim, 1st, The tube, A, the spiral shank, B, and the spring, C, when the same are constructed, arranged, and operated substantially as and for the purpose shown and described.

2d, The spring-catch, F, in combination with the spiral shank, B, and tube A, as herein described for the purpose specified.

80,584.—CAR COUPLING.—William S. Anderson, Shelbyville, Tenn.

I claim the combination of the lever, C, bolt bearer, D, bolt, E, and link, F, in connection with the buffer, A, and coupling frame, B, secured to the car by the bolt, H, all constructed and arranged as described, and for the purpose specified.

80,585.—SEED PLANTER.—Moses Atwood, New Sharon, Iowa.

I claim, 1st, The attaching of the seed-distributing apparatus to a frame, G, placed on the frame, A, of the machine, and attached thereto by hinges, and arranged in connection with a windlass, in the manner substantially as shown, to admit of the furrow and covering shares being raised when necessary, as set forth.

2d, Operating the seed distributing plates, q q, through the media of the treadle shaft, R, and bent levers, S S, arranged substantially as set forth.

3d, The adjustable bar, K, arranged as shown in connection with the bars N N, on which the seed boxes, M M, are secured for the purpose specified.

4th, The combination of the frame, G, with the frame, A, provided with truck-wheels, when said frames are used in connection with a seed-dropping mechanism, as set forth.

80,586.—MACHINE FOR REMOVING WIRE TEETH FROM CARDS.—John A. Baham, Robert C. Wilson, and Samuel French, Auburn, N. Y

We claim, 1st, The toothed drums, B' and C', the card-guide upon the bar, U, and the adjustable plate, x, provided with the guides, y y, combined and arranged substantially as and for the purpose set forth.

2d, The toothed wheel, T', when used in combination with the drums, B', and C', as and for the purpose set forth.

3d, The knives, E', and wheel, T', in combination with the drums, P M and Q, constructed and operating as and for the purpose set forth.

80,587.—BEE-HIVE.—Zebiah W. Bassett, Fulton, N. Y., administratrix of the estate of N. P. Basset, deceased.

I claim, 1st, The securing of the comb-frames, G, in the box, C, by means of the screws, q, and spurs, r, substantially as shown and described.

2d, The exit passage, m, in connection with the entrance passages, h i, and chamber, j, all arranged substantially as and for the purpose specified.

80,588.—STOCKING DARNER.—Simeon R. Bolton, Prescott, Wis.

I claim a stocking tree, consisting of detachable heads and shaft, the heads being of different sizes, and the shaft provided with a cavity for use as a needle case, all arranged substantially as herein described.

80,589.—DENTISTS' AND BARBERS' CHAIR.—Alonzo T. Boon, and James B. Finchure Galesburg, Ill.

We claim, 1st, The combination and arrangement of the head-rest, F, crank, G, with a grooved cam, b, and rubber, c, affixed therein, and plate, H, with the back of the chair substantially in the manner and for the purpose as herein shown and described.

2d, The combination and arrangment of the support, A, rod, B, spiral spring, C, helical screw, D, and rack, E, with the seat of the chair, substantially in the manner and for the purpose as herein shown and described.

80,590.—LAMP.—S. C. Brockington, Groton, Conn.

I claim 1st the self acting valve attachment to lamp reservoirs, consisting of the valve, c, attached to a float, E, and made and operating substantially as herein shown and described.

2d, The device set forth in the foregoing clause, in combination with the perforated guard, F, arranged as shown.

3d, The combination of the lamp reservoir, C, with the guard, F, float, E, and valve, c, and with the pipe, B, stop-cock, C, and tank, A, all make and operating substantially as herein shown and described.

80,591.—WEATHER STRIP.—Albert C. Brown, Chicago, Ill.

I claim the combination of the molding, a b, with the stop, C, provided with a groove, c, arranged substantially as and for the purposes specified.

80,592.—STEAM TRAP.—Robert Brown, Norwich, Conn.

I claim the arrangement of the steam exhaust chest, A, the perforated partitions, F G, the disk valves, H I, and their common stem, J, with relation to each other and the cylinder, as herein shown and described.

80,593.—COTTON SEED CLEANER.—Thomas W. Brown, Cudworth, Barnsley, England.

I claim, 1st, Removing the fiber from the hull of cotton seed by successively heating and cooling the same, by means substantially such as herein shown and described, and for the purpose set forth.

2d, The combination with the heater, B, of the feeding rollers, E F, hopper D, and spout, G, substantially as and for the purpose herein shown and described.

3d, The combination, with the heater, B, of the agitating pan, L, substantially as and for the purpose described.

80,594.—SKEIN-SETTER FOR AXLE.—John Burt, Sturgis, Mich.

I claim, 1st, The employment of the slide, h, in crank, D, for adjusting the arm, substantially as and for the purpose specified.

2d, The wave, g g, when hinged or pivoted at both ends, substantially as set forth, for the purpose of accommodating them to the set of the arm.

3d, Providing the crank, D, with a rocking box, a, and attaching screw shaft, b, thereto, substantially as described.

4th, Finally, wheel B, constructed substantially as set forth in combination with hinged or pivoted ways, g g, screw shaft, b, knife block, E, divided nut, e, and crank, D, for the purpose described.

80,595.—PRUNING-SHEARS.—Daniel Campbell, Elizabeth, N. J. assignor to Henry Seymour and Robert H. Seymour, New York city

I claim the holder, K, in combination with the movable blade, D, and fixed blade, B, of a pair of pruning shears, when said holder is applied or arranged so as to be operated automatically from the movable blade, D, substantially as and for the purpose set forth.

Also, operating the movable jaw, D, through the medium of the cross arm, I, attached to the shaft, H, which is provided with the crank, G, to which the spring, J, and rod, F, are attached, all arranged substantially as shown and described.

80,596.—CLAMPING KNIVES OR CUTTERS OF MOWING MACHINES WHILE BEING GROUND.—Henry J. Case (assignor to Henry Richardson, Auburn, N. Y.

I claim in combination with the clamping and holding bar, A, the series of clamping hooks, actuated through a common lever for fastening and releasing the reaper bar or sickle, substantially in the manner and for the purpose described.

80,597.—MEDICAL COMPOUND FOR TREATING HOG CHOLERA.—N. H. Cass, Henryville, Ind.

I claim the compound composed of the above mentioned ingredients, in about the proportions named, substantially as and for the purposes described.

80,598.—HARVESTER CUTTER.—G. W. Chapman, Jr. (assignor to himself and W. A. Plantz) Iowa Falls, Iowa.

I claim the sickle-bar, constructed as described, consisting of the upper bar, b', provided with the inclined slots, s, for the passage of the screws, h, the lower bar, b, having a groove for the reception of the ribs, c, of the teeth, a, said bars being adjusted to clamp the teeth by means of the screw, e, in their upset ends, as herein described for the purpose specified.

80,599.—BURGLAR-ALARM LOCK.—Nash Cheek, Chapel Hill, N. C. Antedated July 30, 1868

I claim, 1st, The lever, Fx, connected with the bar, i, as shown in combination with the sliding bar, F, at the outer side of the lock, and attached to the shutter or door, and arranged so as to operate an alarm, substantially as shown and described.

2d, The lever, C, pivoted to the bar, F, in connection with the spring, k, toothed wheel, H, cord, J, and weight, K, or an equivalent, arms, m, on the drum of the shaft, I, shaft, M, with arm, L', and bell hammer, N, attached, spring, O, and bell, P, all arranged and combined to operate in connection with the lock substantially as set forth.

80,600.—POST DRIVER.—Alvin B. Clark, Richmond, Ind.

I claim, 1st, The device, constructed substantially as described, and arranged upon a wagon in such a manner as to throw the weight of the vehicle upon the post, as and for the purpose set forth.

2d, The combination of lever clamps, B B, center beam or lever, C, screw, D, with its lever, J, hoisting screw, G, with its base, F, and lever, H, a ocket-plate, I, all operating substantially as described, and for the purpose set forth.

80,601.—SWITCH.—James T. Clark, and John B. Besler, Galesburg, Ill.

We claim the combination of the two short, G G', and two long, H H', pointed movable rails with two stationary rails, I2 E', forming a treble safety switch, the whole arranged and operating substantially as and in the manner herein described and specified.

80,602.—ELEVATOR BUCKET.—O. W. Clark, Appleton, Wis.

I claim the elevator bucket, constructed in the form herein shown and described, as and for the purpose set forth.

80,603.—RACK FOR FEEDING SHEEP.—J. C. Colflesh, Delaware, Ohio.

I claim the tapering rack, C, supported on the frame, A, by means of its shaft, B, and provided with a hinged lid, E, pawl, c, and ratchet, c', and operated by the crank, D, so that it can be revolved to prevent the sheep from feeding, to allow its being filled with provender, and prevent the ingress of rain or snow, as herein set forth.

80,604.—RICE CULTIVATOR.—George W. Cooper, Ogeechee, Ga. Antedated July 30, 1868

I claim, 1st, The cutter, D, of a rice cultivator, when arranged as described with upturned cutting sides, a a, substantially as set forth.

2d, The curved cutters, E E, when arranged on the sides of the cultivator, so as to cut close to the plants, without injuring the same, as set forth.

3d, The revolving toothed breakers, H H, when arranged with beveled edges, and when made and operating substantially as herein shown and described.

4th, The revolving breakers, H H, when made as set forth, in combination with the washer, b, and cleaners, I I, all made and operating substantially as herein shown and described.

5th, Making arms, F, in which the axle, G, of the breakers has its bearings, adjustable on the beam, A, so that thereby the hight of the breakers can be adjusted as set forth.

6th, A rice cultivator, consisting of the beam or frame, A, with the cutters D E E, and breakers, H H, all made and operating substantially as herein shown and described.

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80,605.—BUCKLE.—L. D. Cowles, Romeo, Mich.

I claim the lugs. C C, on the sides of the frame, B, in combination with the frame, A, having inclined edges, whereby the end bars of the two frames are made to hold the strap, substantially as and for the purposes herein set orth.

80,606.—APPARATUS FOR DISINTEGRATING GRAVEL CONTAINING GOLD, ETC.—L. B. Cox, San Francisco, Cal.

I claim, 1st. The slotted bottom or floor, d, of the tub, D, when constructed in several independently removable pieces, for the purpose specified.

2d, The combination of the tub, D, slotted floor, d, rake, F, shaft, G, and receiving vessel, B, when the several parts are constructed to operate substantially as and for the purpose set forth.

80,607.—CORE BAR.—Richard T. Crane, Chicago, Ill.

I claim the combination of the bars, A, and cross bar, B, when constructed substantially as and for the purposes specified,

80,608.—LOOM.—George Compton, Worcester, Mass.

I claim, in combination with the hooked jacks, the angular lifter and depresser bars or levers, the inclination of which is effected by means substantially as set forth.

Also, in combination with lifter and depresser bars, the inclination of which is effected as and by means substantially as set forth, the even bars or levers, connected to the lifter and depresser bars, by the slide rods, and the links, s, substantially as described.

Also, the rocker wheel or segment, l, for imparting movement to the lifter and depresser bars or levers, substantially as shown and described.

80,609.—FENCE.—Henry J. Culp, Goshen, Ind.

I claim the panels, A, hung upon the pin, a, in combination with the crossed stakes, D D, whereby the lateral movement of said panels is prevented, as herein shown and described,

80,610.—FEATHER RENOVATOR.—W. F. Daugherty (assignor to himself and Hiram Elliott), Wellington, Ohio.

I claim the faucets, E, in combination with the pipes, b, and side pipes, D D', for the purpose specified.

80,611.—POTATO DIGGER.—James P. Davison, Rome, N. Y.

I claim, 1st, The combination of the share or point, N, apron, O, vibrating shaker, S S', and clearing fingers, V V', arranged and operating substantially as and for the purpose set forth.

2d, The endless apron O, consisting of the belt, o, transverse bars, o1 o2 o3, and links, o4, employed and operating substantially as and for the purpose specified.

3d, The lips or flanges, a, in combination with the cross-bars, C C'G, beam, D, and braces, L, substantially as described.

80,612.—COUNTING REGISTER.—Jacob S. Detrick (assignor to himself and William R. Eckert), San Francisco, Cal.

I claim the combination of the lever, G, or its equivalent, with the detachable spindle, J, and the wheels, E I, when the parts are constructed and arranged so as to operate together, substantially in the manner and for the porpose indicated,

80,613.—BROOM.—Robert F. Dobson, Goderich, Canada.

I clain, 1st, The turning ring, a, affixed to the rolling barrel, D, by means of the braces, B, substantially as herein shown and described, for the purpose set forth.

2d, As a new article of manufacture, a broom in which the corn is applied and secured as herein shown and described.

80,614.—HARVESTER PITMAN.—Oliver P. Drury, Niles, Mich.

I claim the described construction of the coupling, consisting of the recessed jaw, C, formed upon the bar, A, the recessed jaw, B, provided with the extension, J, adapted to be moved between the guides, a a, by means of the screw bolt, E, extending through the jaw, C, all operating as described, the proximate recesses in the jaws, B C, receiving the ball, G, upon the shank of the pitman, D, as herein set forth and shown.

80,615.—SPARK ARRESTER.—Daniel Eberhart, New Pittsburg, Ohio.

I claim the within described spark arrester when constructed and operating substantially as and for the purposes herein set forth.

80 616.—CHURN.—D. A. Fiske, Delavan, Wis.

I claim, 1st, The paddles or floats, G, and shafts, F, constructed and arranged substantially as herein shown and described. in combination with each other and with the dasher frame, E, as and for the purposes herein set forth.

2d, The sliding bar, M, in combination with the dasher handle, D, cover, I, side boards, L, and cleats, J, substantially as herein shown and described, and for the purpose set forth.

3d, Forming the chamber, K, by inserting the ends of the side boards, L, in grooves formed in the inner sides of the cleats, J, substantially as herein shown and described, and for the purpose set forth.

80,617.—DOUBLE ACTION PUMP.—P. Foley, Nineveh, N. Y.

I claim the arrangement of the lever, M, with relation to the cylinders, A B, chamber, I, valve, d, and valves, b b, whereby, as the piston, C, descends, the valve, d, is opened, by means of the lever, M, to discharge the water from the chamber, 1, into the cylinder, A, the valves, b b, being operated to discharge the water from the cylinders, A R, into the chamber, D, by the alternate strokes of the pistons, C D, as herein described, for the purpose specified.

80,618.—CHIMNEY COWL.—William C. Frailey, Ironton, assignor to himself and D. T. Woodrow, Cincinnati, Ohio.

I claim the combination of the flanged base, B b, slides, c c', cap, d, lugs, e f g, and connecting bolts, h, all constructed and employed substantially as and for the purposes set forth.

80,619.—OTTOMAN AND HASSOCK FILLER.—Elnathan G. Gaylard, New York city.

I claim the vertical moveable tube, C, ring, B in combination with the molding bottom, D, all arranged and acting conjointly as herein shown, and for the purpose set forth.

80,620.—WATER AND DAMP PROOF PAPER FOR COVERING WALLS.—Carolina Goessling, Jersey City, N. J.

I claim as an article of manufacture, paper, prepared substantially as described, and for the purposes herein set forth.

80,621.—BLACKING BRUSH SCRAPER.—John Goodenough, Jerseyville, Ill.

I claim the scraper, B, provided with the hook, x5, straight and curving edges, x x1 x3, and attached at right angles to the rod, B, as shown, the latter being bent at b b1 b2, and fastened to handle of brush A, as shown and described, the rod and scraper being so operated in connection with the handle, that when needed for use the former is turned forward and firmly held by the notch, c, and when not needed may be turned backward and held by the hook, x5, catching in the socket in the handle, as herein fully set forth.

80,622.—SCREW DRIVER.—Winfield S. Goss, Baltimore, Md.

I claim the screw driver handle, composed of the parts, C C' C", provided with holes, r r, the bolt, D, spring, s, and lock bolt, n, the whole being constructed to operate substantially as described,

80,623.—GLASS FURNACE.—Niles Granger, Saratoga, N. Y.

I claim the pot, B, formed of the parts, C and D, connected by the passageway, E, and operating substantially as and for the purposes described.

80,624.—CHURN AND BUTTER WORKER.—Samuel L. Hall, West Salem, Wis.

I claim, 1st, The metal churn, E, with the exterior vessel, P, both attached to the frame, A, provided with the locking device, o, all constructed and arranged to operate substantially as herein described, and for the purpose set forth.

2d, In combination with the bevel wheel, J, and winch, L, the dasher, G with the curved beaters, p, and grooved pin, h, bevel pinion, I, and brake, H, all constructed and arranged to operate substantially as herein described and for the purpose set forth.

80,625.—LET-OFF MECHANISM FOR LOOMS.—Wm. Hall (assignor to himself and J. W. Pitt), North Adams, Mass.

I claim the pivoted bearing, c, with the bar, e, attached, in combination with belt, B, pulley, g, on shaft, A, and spring, i, all consstructed and arranged substantially as and for the purpose set forth.

80,626.—THILL COUPLING.—I. C. Hart, Galesburg, Ill.

I claim the plate, H, and hook, L, constructed and arranged as described. and combined with the axle, A, clip, P, and tongue or thills, J, substantially as described and for the purpose set forth.

80,627.—MACHINE FOR BENDING WOOD.—Levi Heywood, Gardner, Mass.

I claim, 1st, Commencing to bend the wood from each end toward its center. instead of comencing to bend it from the center toward the ends, or from one end toward its other end, substantially as and for the purpose described.

2d, The formers, B B, with the geared tables, c c, working in the rack, D, and guided by the slots, a a, in combination with a suitable chain, H, substantially as and for the purpose described.

80,628.—DOUBLE VOLUTE SPRING.—Joseph Hobart, Boston, Mass.

I claim, 1st, A double volute spring composed of a single bar of metal, and made by bending said bar at the middle, doubling it upon itself, and coiling the same around a mandrel, or otherwise, substantially as described.

2d, In making double volute springs, in the manner set forth in the foregoing clause, so bending the limbs that the edges thereof shall describe lines of unequal curvature, but so that the curvature, commencing at or near the point of junction of said limbs, shall increase from thence outward toward the extremities thereof, substantially as described.

3d, In making a double volute spring, in the manner set forth in the first clause, bringing the two free ends near together, leaving an opening between the limbs which narrows toward the ends, substantially as described.

80,629.—MACHINE FOR SEPARATING AND CONCENTRATING Sulphurets.—Andrew Hunter, San Francisco, Cal. Antedated July 25, 1868.

I claim, 1st, The formation of the trough or table, B, with or without metallic lining, and alternately inclining and level, as shown by lines, a b d, substantially as described and for the uses and purposes as set forth.

2d, The combination, with the table or trough, B, and its adjustable hangers, of the cam shaft and spring, X, under the arrangement described, whereby both the oscillatory motion and percussion of the said table are effected, for the purpose of separating the sulphurets and metals from the lighter particles, as set forth.

3d, The eccentric strap, Z, in combination with the trough, B, and cam, or equivalent means, for imparting an oscillatory movement to said trough, substantially as and for the purposes set forth.

4th, The combination, with the table, B, and mechanism for imparting to the same an oscillatory movement, of the rocking trough, E, arranged for operation substantially as and for the purposes set forth.

5th, The combination, with the oscillatory table or trough, B, of the rotary scraper, W, made of india-rubber, or other suitable material, substantially as set forth for the purposes specified.

6th, The combination, with the table or trough, B, of the inclined screen, T, and mechanism for imparting to the same a vibratory motion, under the arrangement and for operation as herein set forth.

7th, The combination, with the oscillating trough and hanger, by which the rear end of the trough is held, of the wheels or rollers, R, for supporting the front end of said trough, substantially as herein shown and described.

8th, The combination of the table or trough, E, with eccentric troughs, E and G, hangers, D D, spring, X, wheels or rollers, R, scraper, W, and sieve, T substantially as described, and for the uses and purposes as hereinbefore set forth.

80,630.—ROTARY STEAM ENGINE.—N. Jackson and A. W. Jackson, Napoleon, Ohio.

We claim, 1st, The curbed spring, a, in combination with the L-shaped metal pieces, b b, arranged in the valves, F F, substantially as herein set forth.

80,631.—ARTESIAN PUMP.—L. Jennings, Brooklyn, N. Y. Antedated July 23, 1868.

I claim, 1st, The within-described construction and arrangement of the packing, D d' E, the same being composed of the soft and water-retaining cup-leather, E, and the hard and expansible exterior, D, the latter being in the form of a ring or hollow cylinder, open on one side, with one or more offsets, d', at the joint, all these several parts being constructed and arranged relatively to each other and to the box, B, and barrel, A, substantially as and for the purpose herein set forth.

2d, The partial spiral or incline, B5, and corresponding ratchet ring, G1 G2, arranged as represented, the ring, G1 G2, being allowed to traverse axially within the yoke or inclosing ring, A3 and to lock itself in new relations thereon, as the bucket B, descends, substantially as and for the purpose herein set forth.

80,632.—HEAD BLOCK FOR SAW MILL.—Nelson Johnson, Jasper, N. Y.

I claim, 1st, The eccentric longitudinal rests, L L', either or both, when constructed with a flat fall, l, and dogs, l', and operating substantially as described for the durpose specified.

2d, The vertical slots, i6, when employed in combination with the upper longitudinal rest, L, for the purpose of rendering said rest adjustable to suit different sizes and taper of logs, substantially as described.

3d, The combination of the levers, 3, ratchet rack, 4, link, 2, and vertically sliding dog, 1, with the standard, 5, substantially as and for the purpose specified.

80,633.—STEAM GENERATOR.—J. Kelshaw, La Fayette, Ind.

I claim a zigzag or undulating flue, formed by the alternately projecting water chambers, C C, substantially as herein described.

80,634.—MACHINE FOR GRINDING AND POLISHING SCHOOL SLATES.—Wm Kester, Cherryville, Pa.

I claim, 1st, The track, b b', when composed of the double inclines, t t', and used in connection with the cars, G G, and grinding stones, D D, in the manner and for the purpose specified.

2d, The combination of the movable bed, H, springs, s s, and body of the car, G, substantially as and for the purpose specified.

80,635.—WATER WHEEL.—T. J. Kindleberger, Eaton, Ohio.

I claim, 1st, The water wheel consisting of the plate, A, and rims, B and C, with the two tiers of buckets, E and F, all constructed and arranged substantially as herein described.

2d, The rim, C, and buckets, F, when constructed and combined as set forth.

3d, The combination of the pinion, I, segmental rack, H, rod, P, and collar, G, when arranged in connection with the case and vertical gates of a water wheel, as hercin shown and described.

80,636.—COOKING STOVE.—W. F. Kistler, Chicago, Ill., assignor to himself and G. W. Gillette.

I claim a stove, so constructed that the heat and smoke may pass through a chamber, space, or flue in the doors of the oven, substantially as and for the purpose specified.

80,637.—INDICATOR LOCK.—Thomas Lalor, Toronto, Canada, assignor to John Dewe, George Harding, and Bartholomew Lalor.

I claim, 1st, The cylinder, a, arranged in the lock in such a manner that it will cause the motion of the indicator, whenever the key is operated, to open the lock, as set forth.

2d, The slide bolt, d, by which the cylinder, a, is moved, as described.

3d, So constructing the tumblers or a lock that they will lock the cylinder, a, substantially in the manner herein shown and described.

4th, The guard, p', attached to the slide bolt, d, for the purpose of protecting the bolts, n, to prevent the lock from being picked, as set forth.

5th, The application of indicator wheels, f g h, or their equivalents, to a lock, the same being moved or set, whenever they key is turned in the lock, substantially as and for the purpose herein shown and described.

6th, The combination of the indicator wheels within the locking pin, i, which can be protected by a seal, as set forth.

80,638.—WATER WHEEL.—J. Y. Lanfair, Queensbury, N. Y.

I claim the wheel, A, constructed or cast with buckets, J, having two parts b b', arranged as shown, in combination with the curved throats, H H, all arranged substantially as and for the purpose specified.

80,639.—HINGE.—Elijah Lindsley, Neenah, Wis.

I claim the bent pivot, b, in combination with shoulder, a, and plates, d d, the whole forming a right-and-left hand, substantially as herein shown and described.

80,640.—MODE OF WATER-PROOFING PAPER, CLOTH, ETC.—R. O. Lowrey, Salem, N. Y.

I claim, 1st, The process of making paper, cloth, and all similar fabrics, as well as leather, comparatively water proof, as herein described.

2d, The products resulting from the application of my process to pulp, paper, cloth, and similar fabrics, as well as leather, as herein described.

80,741.—ARTIFICIAL GUM FOR COATING AND WATER PROOFING.—R. O. Lowrey, Salem, N. Y.

I claim, 1st, The composition, made by mixing a solution of salt and alum with a solution of soap, as herein described, for the purpose of producing an artificial gum.

2d, The composition, made by mixing my artificial gum with oils, resins, grease, gum, wax, fibrous materials, or their equivalents, substantially as herein described and for the purpose set forth.

80,642.—MANUFACTURE OF ILLUMINATING GAS.—W. L. Lowrey, Saratoga Springs, N. Y.

I claim, 1st, The process of distilling illuminating gas from coal tar, hydrocarbon oils, resins, wax, and the residuum of petroleum, substantially as herein described.

2d, The use of the hydrate of lime, within the chamber or retort, in the manufacture of illuminating gas in the ordinary way or by my process, substantially as herein described.

80,643.—ROTARY CULTIVATOR.—George F. Lynch, Milwaukee, Wis.

I claim, 1st, The shape of the tooth and the manner of finding the curve of the same, to suit any sized head or cylinder, as herein recited.

2d, Having the heads loose on the axle, to prevent clogging or choking, as herein described, in combination with the attaching the heads to the truck by straps, so as to permit each head or cylinder to act and move over obstructions independently.

80,644.—VALVE ARRANGEMENT.—Philander Macy, Rochester, N. Y.

I claim, 1st, The construction of the valve, K, with opening, d, bars, ff, lugs, h h, offsets, k k, and projection, r, as herein set forth.

2d, The combination of the rod, M, provided with the turning hook, s, and collar, t, and the lever, L, and spring, n, with the valve, K, and its projection r, operating substantially in the manner and for the purposes specified.

80,645.—STOVE GRATE.—A. J. Magoon, Providence, R. I.

I claim the combination and arrangement of the revolving grates, C C, horizontal shaft, B, lugs, e e, tubular shafts, a a, and beveled pinions, b b, all operating as described, whereby the grates are revolved separately and dumped simultaneously, as set forth and shown.

80,646.—MANUFACTURING AND PURIFYING SPIRITS.—P. Martin, Forest Grove, Oregon. Antedated April 4, 1868.

I claim, 1st, The manufacture of alcohol and other spirits, in the manner substantially as herein described.

2d, The use of saline matter for manufacturing and purifying spirits in combination with my said process, substantially as described.

80,647.—DEVICE FOR FEEDING SAWDUST, ETC., TO FURNACES. J. A. McClelland, Vernon, Ind.

I claim, 1st, The application of a suction and blast fan to planing, circular saw, sand belt, or other wood-working machinery, when arranged in the manner shown, or in an equivalent way, to draw the shavings or sawdust from the machine and feed them to a furnace or discharge them from the building or shop, substantially as set forth.

2d, The arrangement of the two fans, D D', spouts, G K L F, and the valves J I, to operate substantially as and for the purpose specified.

3d, The air-escape pipe, H, in combination with the spouts, G K L F, and valves, J I, all arranged for joint operation, substantially as and for the purpose set forth.

80,648.—MOLDING MACHINE.—Charles H. Mellor, Philadelphia, Pa.

I claim the combination of the vertical cutter-bearing mandrel, N, having glands for controlling the belt with the table, D, made adjustable vertically by wedges placed on a frame, C, connected by hand wheel, F, and screw, I, all constructed and operated substantially as described.

80,649.—GAGE.—B. F. Merrill, West Lebanon, N. H.

I claim an adjustable measure for key holes consisting of the strips, B C, adapted to be forced apart by the action of springs, and clamped in the desired position by means of set screws or nuts, substantially as herein shown and described.

80,650.—CURTAIN FIXTURE.—Lucius E. Michell, Cincinnati, Ohio.

I claim the combination, substantially as described, of the perforated plate B b, pivoted spring catch, C D, stud, d, and pulley, E, for the purpose specified.

80,651.—WASH BOILER.—C. E. Miller, Indianapolis, Ind.

I claim the arrangement of cover, D, having perforated rim, d', and unperforated top, d, oblique and perforated diaphragm, E, pipe, G, and nozzles, g g', substantially as set forth.

80,652.—CLAY MILL.—Levi Moore, Baraboo, Wis.

I claim the disk, L, with its projections, in combination with the grinding plates, a and N, the floor, D, having chutes and opening, O, the horizontal grinding plates, G P, having wedge-shaped projections, the shaft, I, floor, H, and doors, Q Q, all substantially as and for the purpose shown and described.

80,653.—TUCK CREASER FOR SEWING MACHINE.—A. Morehonse and A. R. Heath, Danbury, Conn.

We claim, 1st, The bent arm, C, attached to the presser piston, A, when constructed with the slot, D, needle hole, B, spring guide, J, and guide swell O, substantially as and for the purpose set forth.

2d, The combination of the slotted arm, C, constructed as described, with the adjustable bar, N, and spring presser, F, as set forth.

3d, The combination of the presser piston, A, slotted arm, C, spring guide, J, guide, O, and spring presser, F, with the adjustable guide, H, or marker, I, arranged to operate substantially as described.

80,654.—LOG SLED.—C. W. Mosher, East Leon, N. Y.

I claim a log sled having the roller, f, chain, d, swinging frame, B, and its accessory roller, e, chain, a', and any log hooks, d, all substantially as shown and described and for the purpose set.

80,655.—COMPOSITION FOR DESTROYING INSECTS IN WHEAT. Joseph Newcomer, Baltimore, Md.

I claim the compound of the salt briue and copperas in the proportion, and the mode of treating the wheat, as hereinbefore fully described.

80,656.—FOLDING CHAIR.—J. Nicolai, Boston, Mass.

I claim a folding chair, having its seat, C, and legs, A A, connected by the bar, D, rings, e e, and guide rods, d d, all arranged substantially in the manner as and for the purpose set forth.

Also, the legs or steps, f f, attached to the seat, C, in combination with the bar, D, rings, e e, and guide rods, d d, for the purpose specified.

80,657.—PORTABLE FENCE.—J. W. Norman, Eugene, Ind.

I claim the combination of the pickets, A' A', the rings or collars, m m, the posts, B B, having the sockets, s s, the rods, r r, and the links l l, substantially as described.

80,658.—CHURN.—Josiah Oothoudt (assignor to himself and H. C. Jerauld), Minneapolis, Minn.

I claim the tub, C, dasher, B, sleeve or casing, c, hollow shaft, E, wheel, F, shaft, D, and gear, e e, when all are combined and arranged substantially as and for the purpose specified.

80,659.—SMOKE STACK.—W. H. Parker, Memphis, Tenn.

I claim the combination of three sections, E F and G, with the levers, A A, with the latches, C C, the springs, D D, the racks, B B, the three or more springs, I I, the fulcrum, g, constructed and operated substantially as herein set forth.

80,660.—COMPOUND FOR DESTROYING INSECTS IN PLANTS.—W. A. Phillips, Perry Center, N. Y.

I claim the composition prepared of the ingredients and in the proportions and manner, substantially as herein described and set forth.

80,661.—FENCE.—S. B. Pierce, Homer, N. Y. Antedated July 29, 1868.

I claim the combination of the fence panels, B B, clasp, C, as constructed and posts, A, forming a portable fence, as set forth.

80,662.—CARRIAGE-CURTAIN FASTENER.—H. E. Pond, Franklin, Mass.

I claim the improved device, before described, for fastening the curtains of wheeled vehicles, consisting of the two perforated plates, a and b, riveted to opposite sides of the curtain, as represented, and with the outer one provided with the locking bolt for locking into the stud, d, the whole being in manner and to operate as before described.

80,663.—DEVICE FOR SHEERING BOOMS.—L. W. Pond (assignor to himself and Eau Claire Lumber Co.), Eau Claire, Wis.

I claim the combination of the rudders, B, with the boom, A, whether said boom be made in one or more parts or pieces, substantially as herein shown and described and for the purpose set forth.

80,664.—SWIFT OR REEL.—E. N. Porter and P. P. Roberts, Morrisville, Vt.

We claim the arrangement of the spiral spring, a pin, E, perforated arms, F F, with the block, C, hook, D, and standard, A, substantially as and for the purposes herein set forth.

80,665.—BUNDLING MACHINE.—Edward J. Reddy, Bayville, N. Y.

I claim the handle, C, having the movable hand piece, c1, and stop, 2, the toothed segment, H, shaft, B, and segments, F, constructed to operate the flexible bands, E, as herein described for the purpose specified.

80,666.—GRAIN SEPARATOR.—O. N. Ritch, Geneva, Ill., assignor to himself and W. H. Howell.

I claim, 1st, The combination of the disk, H, and perforated plate, I, with adjacent faces inclined downwards, substantially in the manner and for the purpose set forth.

2d, In combination with said disk, H, and plate, I, the arrangement of a receiver, J, substantially as specified and shown.

3d, The combination of the disk, H, perforated plate, I, receiver, J, and chutes, K L, arranged to operate substantially in the manner described.

4th, The rim, M, provided with openings or notches, m, when arranged with respect to the passages, n, in the manner specified.

80,667.—LEAD PIPE CONNECTION.—W. D. Richardson, Springfield, Ill.

I claim the improved pipe-joint herein described, the lead, E, being compressed within the flaring lip, D, by compressing the lengths of pipe forcibly together, and a space, C', being left around the extreme end of the male part, to allow the parts to be set at a slight angle without difficulty, all substantially as and for the purposes herein set forth.

80,668.—BEDSTEAD.—L. W. Roath, Lexington, Ohio.

I claim the cross rail, K, loops, d, as arranged in combination with the cord F, and sections, H G, substantially as and for the purpose set forth.

80,669.—DUMPING CART AND WAGON.—W. W. Rogers, Hampden Corner, Me.

I claim, 1st, The combination of the spring bolts, G, cords or chains, H, and pullers, I with the hinged tail board, E, stakes, J, and body, D, of the cart or wagon, substantially as herein shown and described, and for the purpose set forth.

2d, The combination of the brace rods, K, and cross bar, L, with the stakes, J, and shafts, C, substantially as herein shown and described, and for the purpose set forth.

80,670.—CARRIAGE TOP.—J. F. Sargent, North Turnbridge, Vt.

I claim the pivoted interior rod, D, in combination with the double-jointed tubular shaft, C, slotted near its center, sliding ferrule, I, grooved and notched ring flange, H, disk, E, braces, G, and curved radial ribs, F, all constructed and operating as described, for the purpose specified.

80,671.—GRAIN-DRILL SHOE.—Peter Schmitt, and Peter Jacob Schmitt, Waterloo, Ill.

We claim, 1st, The shoe, A, when provided with a slotted ing, a, and combined with the rod, B, and links, C, as herein described and shown.

2d, Therod, B, when provided with adjusting holes, b2, and coupled with links, C, by means of the joint pin, b, and the wooden pin, b4.

3d, The arrangement of the curved slot, a', pin, e', and links, C, substantially in the manner herein shown and described.

80,672.—SASH AND WINDOW FRAME.—Johann Schnell, New York city.

I claim, 1st, The hinged frame, B, in which the sashes, C D, slide up and down, as specified.

2d, The arrangement of the window sashes, C D, in a frame, B, which is hinged to the casing, A, all constructed to operate substantially as herein shown and described, for the purpose specified.

3d, The bars or plates, G, when removably secured to the sashes, and held By means of the catch, i g, all constructed and arranged to operate in the manner and for the purpose substantially as herein set forth and shown.

80,673.—DEVICE FOR SOLDERING TIN CANS.—William Serviss, Sidney, Ohio.

I claim the tubular holder, A, when provided with the slots, C, screws, D, and nuts, D', arranged and operating substantially as and for the purpose described.

80,674.—YOKE.—F. M. Shields (assignor to himself and John W. Sanders), Macon, Miss.

I claim, 1st, The combination, with a halter, of the yoke herein described, consisting of the strip, C, and hooks, D and E, substantially as and for the purpose described.

2d, The improved animal yoke, herein described, composed of the strip, C, hooks, D and E, substantially as and for the purpose described.

80,675.—MEAT CUTTER.—David Slaughter, West Hempfield Township, Pa.

I claim the arrangement of the circular knives, N, and weighted sliding car and box, Q, with its slotted arms, I I', in combination with a revolving block, L, and crank and screw shaft, D S, substantially in the manner and for the purpose specified.

80,676.—FASTENING FOR BRACELET.—George H. Soule, Jersey City, N. J.

I claim the clasp or fastener, A, as shown and described,

80,677.—BALANCE SLIDE VALVE.—John D. Stewart, La Porte, Ind.

I claim, in combination with the slide valve, B, valve-chest, G, and cover, G1, and steam chamber, F, the packing plates, H, to the back of which steam is admitted from the steam chamber, substantially as and for the purpose set forth.

80,678.—SPOKE TENON.—Geo. W. Stouffer, Lewistown, Pa.

I claim the provision in a spoke tenon of the grooves or concavities, b b2 b3, employed and operating as described, for the purposes specified.

80,679.—FILE CUTTING MACHINE.—Sedgwick A. Sutton, Dixon, Ill., assignor to himself, W. Uhl, and Lysander Flagg.

I claim, 1st, The combination and arrangement of the pivoted guide plate, B, slides, C and E, and the convex pressure roller, F, substantially as and for the purpose specified.

2d, The loaded lever, I, arranged or applied substantially as shown, with the standard, J, and oblong slot, h, in combination with the slides, C E, and convex pressure roller, F, substantially as and for the purpose set forth.

3d, The clamp, K, composed of the jaws, j j', lever, M, provided with the pins, n o, and the catch, L, applied to the clamp, and all arranged to operate in the manner substantially as and for the purpose specified.

80,680.—CORN AND POTATO COVERER.—James Swart, Hoffman's Ferry, N. Y.

I claim, 1st, The covering shares, G G', constructed as represented and described, and provided with the adjustments, g g* a and g1 g1* g2, substantially as and for the purpose set forth.

2d, The combined arrangement of the adjustable lead wheel, E, shares or scrapers, G G', and spring rollers, H H, all substantially as described, for the purpose specified.

3d, The springs, J J', in combination with the frames, A I, and rollers, H H', arranged and operating substantially as and for the purpose described.

4th, The combination of the handles, C, main frame, A, hinged frame, I rollers, H, and wheel, E, all arranged to operate substantially as herein set forth.

80,681.—HAY AND COTTON PRESS.—Benj. F. Taft, Groton Junction, assignor to himself and Daniel Needham, Groton, Mass.

I claim the within described portable pressing apparatus, consisting of the mounted wagon body, A S C D, windlasses, E and R, with their connecting gear, ropes, or chains, d d d d, etc., pulleys, c c c c h and i, follower, S, and cam, a, all constructed and arranged together substantially as herein shown and described.

80,682.—HORSE COLLAR.—Spencer P. Taylor, Oxford, Ohio.

I claim a horse collar divided by a partition, e, into compartments for the reception of different materials, substantially as described.

80,683.—LABEL HOLDER.—G. S. True, Leavenworth, Kansas.

I claim the carp holder consisting of the parts, D E, the former being hinged to the latter, which is adapted to be so attached to the trunk as to form a magazine, C, substantially as herein shown and described.

80,684.—WAGON BRAKE.—W. H. Tucker, Sunman, Ind.

I claim the blocks, E, rods, F and P, straps, K and N, sheave, O, rods, L M, spring, H, and lever, J, all constructed and arranged substantially as and for the purpose set forth.

80,685.—CHURN DASHER.—T. W. Tyler, Corry, Pa.

I claim the knife wheels F E G, constructed and operating substantially as

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herein shown and described, in combination with the long tenon, D, of the dasher handle, C, as and for the purpose set forth.

80,686.—COMBINED PLOW AND PLANTER.—Isaac H. Walker, Newton, Ill.

I claim, 1st, The mold boards, C C, projecting rearwardly and inwardly from the front mold boards, B B, at the same or a greater depth, substantially in the manner and for the purpose specified.

2d, The combined arrangement of the seed box, D D' d, dropping slide, G, crank lever, F, and treadle, E, all constructed and employed substantially as and for the purpose described.

3d, The harrow, J, constructed as described, and employed in combination with the plows, B C, and planter, D I, in the manner and for the purpose specified.

4th, The combined arrangement of the plows, B C, planter D I, harrow, J, and roller, L, all constructed and operating substantially as and for the purpose described.

5th, The hollow colter or drill, I, in combination with the mold boards, C C, and planter, D, as and for the purpose set forth.

80,687.—TIRE COOLER.—John Wampach, Shakopee, Minn.

I claim the combination of the connecting rods, E, lever, D, connecting rod, G, and lever, F, with each other, with the box, B, beams, C, and frame, A, arranged substantially as herein shown and described and for the purpose set forth.

80,688.—CAR COUPLING.—James White, Harrison, Ohio.

I claim, 1st, The pin, C inclosed within the tight cylinder, B F, and operated by a spring, E, substantially as and for the purposes described.

2d, In combination with the above, the lugs or projections, J K, telescopic hollow stem, J L, and spring, M, all constructed, arranged and employed as and for the purposes specified.

80,689.—GRATE FOR STOVES, RANGES, AND HEATERS.—Richard Whiting and Albert Hamilton, New York city. Antedated July 29, 1868.

We claim an "adjustable grate," so constructed that the size of the fire space may be readily increased or diminished, by raising or lowering one section of the grate perpendicularly, or by inclining the other section or sections thereof to any required angle, by means of a cam, lever, or other device, using either movement separately, or both combined in one stove, range, furnace, or heater.

80,690.—THILL COUPLING.—Hironimus Will, Columbus City, Iowa.

I claim a shaft coupling having pieces, A and B, clutch, D, and spring, E, constructed, combined, arranged, and operating substantially as specified.

80,691.—WEATHER BOARD GAGE AND REST.—Isaac Williams, Westfield, Ind.

I claim the combination of the hollow shouldered part, A, having the parts a1 a2, the graduated adjustable stem, B, and the sliding wedge, D, all constructed, arranged, and operating as herein described, for the purpose specified.

80,692.—GAGE FOR WEATHER BOARDING.—Isaac Williams, Westfield, Ind.

I claim the bars, A, provided each at its outer end with an adjustable pivoted blade, B, and socketed at their inner ends for the reception of the sliding connection, D, which is adapted to be clamped in the desired position, said bars, A, being provided with flangs, a, all constructed, arranged and operating substantially as and for the purpose herein set forth and shown.

80,693.—TANNING.—W. Windoes, Fond du Lac, Wis.

I claim, 1st, The employment of a sugar and bran dump, in combination with the usual tanning process, all substantially as and for the purpose set forth.

2d, The alum and saltpeter tanning liquor, in combination with the preceding process, or other equivalent processes, all substantially as set forth.

80,694.—HARVESTER.—C. W. Witt and B. F. Witt, Indianapolis, Ind., assignors to B. F. Witt.

We claim, 1st, The tipping rake, when constructed and arranged receive the grain as it is cut, and deliver it to the binder, substantially as described.

2d, The box, A, with the seat or binding table, d, in combination with the tipping rake, substantially as described.

3d, The combination of the reciprocating bar, m, and plate, L, having the grooved rollers, o, arranged thereon to form the supports of the bar, m, all substantially as set forth.

80,695.—CAR BRAKE AND STARTER.—John S. Wood, Lansing, Mich.

I claim, 1st, The combination of the cylinder, B, wheel, D, and clutches, E and F, and flanges, G, when constructed and arranged substantially as described.

2d, The combination of the levers, H, flanges, and clutches, E and F, when so arranged that as the flanges are disengaged from the arm, the clutch on the same side will be engaged with the teeth on the hub, substantially as set forth.

3d, The combination of the cylinder, B, and wheel, D, with the flanges, G, when respectively so constructed that a projection from the flanges may be made to engage the arms, B2 or D', and prevent the revolution of the wheel or cylinder, substantially as and for the purpose set forth.

80,696.—EXCAVATOR.—Charles F. Woodruff, Newbern, Tenn.

I claim, 1st, In a revolving scraper or excavator, the combination of the swinging plates, F F, and the rounds, d d2, or their equivalents, substantially as and for the purposes specified.

2d, The combination of the lever, M, having the handle, m, and the hook, n, with the pawl, p, ratchet, w, and body, B, when the parts are constructed to operate substantially in the manner and for the purpose specified.

80,697.—SLEEVE OF KNITTED GARMENTS.—Wm. H. Abel, Greenville, R. I. Antedated July 27, 1868.

I claim, 1st, Making the short sleeves of under shirts, vests, and similar garments, of tapes or strips which have selvage edges, and in which the courses of stitches or loops run in the same direction as in the body of the garment, for the purpose and substantially as described.

2d, Forming the gusset of such sleeves in the manner and for the purpose substantially as described.

80,698.—STEAM ENGINE SLIDE VALVE.—L. H. Allen and John B. Wilford, Tamaqua, Pa.

We claim the arrangement of the bars, m m, with the exhaust openings, L L and passages, i i, whereby to complete the stroke of the valve, C, so as to make the maximum opening of the ports, substantially as set forth.

80,699.—BUTTON.—Henry Ansley, Washington, D. C.

I claim a button or stud constructed with the parts, A B C and C', arranged in relation to one another substantially as described.

80,700.—LOW WATER DETECTOR FOR BOILERS.—John Ashcroft, New York city.

I claim, 1st, The construction, arrangement, and combination of the low water detector tube, B, and fusible plug, D, with the steam alarm tube, F, weighted valve, H, and steam whistle, I, substantially as herein shown and described.

2d, The steam connection pipe, N, and valve, O, in combination with the fusible plug, D, and steam whistle, I, substantially as herein shown, described and set forth.

80,701.—APPARATUS FOR EXTINGUISHING FIRES.—James F. Babcock, Boston, Mass.

I claim a liquid ejecting apparatus having a main water or liquid chamber or reservoir, a, and a gas generating tube, d, this tube having provision at its upper part for holding the gas generating composition to be burned, and the tube and main chamber being constructed and arranged substantially as described.

80,702.—CENTRIFUGAL MACHINE FOR FILTERING, DRAINING, AND DRYING.—Robert J. Barry, Philadelphia, Pa.

I claim, 1st, A forked bar, E, having a yielding bearing, and arranged adjacent to and bearing with its forked end against the suspended shaft of a centrifugal drying machine, substantially as and for the purpose described.

2d, The said bar secured in a frame hinged to the outer casing or other permanent part of the machine, for the purpose set forth.

80,703.—CAR SEAT.—Samuel G. Blackman, Waterbury, Conn.

I claim a reversible or adjustable seat, constructed in the manner described, that is to say, the two parts which form the back and seat, according to the position in which the seat is adjusted, are pivoted upon a common center, so that both are turned to reverse the seat, substantially in the manner herein set forth.

80,704.—UNION VALVE COUPLING.—Sanford O. Blanding, Smithfield, R. I.

I claim a combined coupling and check valve, constructed and arranged substantially as described, for the purpose specified.

80,705.—LAMP.—Henry H. Boucher, Doylestown, Pa.

I claim, 1st, The combination with a lamp and a separate oil reservoir communicating therewith, of the tubular level regulator, E, two way cock, G, and tube, F, arranged and operating substantially as described.

2d, The tube, F, in combination with an oil reservoir and an escape cock, substantially as described.

80,706.—STOVE LEG.—George W. Burling, Trenton, N. Y.

I claim the circular slot, A, when combined with the grooved recess, a a, and the dovetailed lip, C, or their equivalents, substantially as and for the purpose described.

80,707.—GLOVE.—Remus D. Burr, Kingsborough, N. Y.

I claim, 1st, Cutting the front of the hand, thumb, and all the fingers, joined in one and the same piece of material, substantially as shown and described.

2d, In combination with the iron, cut in one piece, as above claimed, cutting the whole or three sides of the fore finger, also joined in said piece, substantially as described.

3d, Cutting the back of the hand and thumb, and the back and sides of the middle and little fingers, all joined in one and the same piece of stuff, substantially as described.

4th, Cutting the back of the hand with the back and sides of the middle and little fingers, all in one piece, as shown and described.

5th, In combination with the back of the hand and the middle and little fingers, cut as above claimed, the back and sides of the ring finger, cut in one piece and sewed to the back, substantially as described.

6th, In combination with the elements of the first claim, cutting the back of the thumb separate from the back of the hand, and joining it thereto by a seam.

7th, In combination with the elements of the third and fourth claims, cutting the front of the thumb separate from the front of the hand, and joining it thereto by a seam.

8th, In combination with the front of a mitten, cut as claimed in the first claim, cutting the back of a mitten with the back of the thumb in one piece, substantially as described.

80,708.—WATER CLOSET.—Wm. S. Carr, New York city.

I claim, 1st, A water closet hopper or container, having the inward flange, e, at the upper end, in combination with the pan, d, the parts being formed substantially as specified, so that the pan can be introduced or withdrawn through the opening in said flange, e, and the pan, when in place, shall set up against the under side of said flange, as set forth.

2d, The divided axis, k m, formed as shown, in combination with the pan, d, and socket, o, as and for the purposes set forth.

3d, The slotted adjustable link, u, in combination with the lever, r, and pull, w v, as and for the purposes set forth.

80,709.—NON-CONDUCTOR OF HEAT.—James Chalmers (assignor to James Chalmers, Jr.), London, England.

I claim the mixtures, in the proportions above described, of glutinous and siliceous clay, as the basis of a non-conducting compound, the calcination or half charring of saw dust, in the manner proposed, so as to preserve its fibrous nature and non-conducting qualities, and the use of wood and other pulp or fiber, and hoofs, prepared as above, for holding and consolidating the non-conductor compound, and for adding to its non-conducting qualities.

80,710.—FASTENING FOR BUTTONS.—Geo. D. Clark (assignor to himself and Clark and Cowles), Plainville, Conn.

I claim the herein described button fastener as an article of manufacture, consisting of the plate, A, with the slot, a, and one or more projections, d, substantially as set forth.

80,711.—UNCHANGABLE STENCIL PLATE.—James J. De Barry, Brooklyn, N. Y.

I claim the within described slots, C D E F, arranged relatively to the opening, a, and the strips, B, the whole being adapted to form an adjustable stencil plate, possessing the advantages and characteristics herein set forth.

80,712.—BASE BURNING STOVE.—T. Parsons Dickerman, New Haven, Conn.

I claim in combination with the reservoir or cylinder, B, of a base burning stove, the slide or cut-off, D, arranged and applied substantially in the manner herein set forth.

80,713.—HOMINY AND PEARLING MILL.—Edwin A. Duer (assignor to Geo. W. Patterson), Decatur, Ill.

I claim the combination and arrangement of the cylinder, B, having recess, D, diaphragm, I, passage, K, and slotted sliding gate, M, rotary shaft, C, provided with beaters, a, rotary screen, Q, fan blower, N, deflector, O, chutes H h P, hopper, E, vibrating shoe, F, and conveyor on shaft, C, all substantially as herein shown and described, for the purposes specified.

80,714.—WATER METER.—A. B. Edmands, Melrose, Mass.

I claim a water meter or motor made with valve blades or flaps, hinged to and swinging against and from an axial drum, such blades being rotated by pressure of the water entering the meter case through the eduction pipe, and each valve blade being thrown out from the drum as its outer edge passes the abutment or wall, substantially as set forth.

80,715.—PLOW.—John Fisher, Middletown, Pa.

I claim the adjustable wing, C, when used in combination with a subsoil plow, B, and constructed and arranged as and for the purpose herein fully set forth.

80,716.—BEEHIVE.—Samuel P. Forgy, Allensville, Ky.

I claim the application to the box or frame, of the self-adjusting transparent light on pivots, which will, at a given or proper time, allow the bee both ingress and egress, as herein described, using for that purpose any transparent substance which will produce the intended effect.

80,717.—HAND LOOM.—Wm. S. Freeman, West Union, Ohio.

I claim, 1st, The driving shaft, M, pawl, P, ratchet wheel, Q, shaft, R with tappets, S, and treadles, C, all constructed, arranged and operating substantially as described, for the purpose set forth.

2d, In combination with the elements of claim first, the picker staff, U u, and strap, V.

70,718.—MEDICINE.—Emil Frese, San Francisco, Cal.

I claim the above described composition for cathartic tea, made of the ingredients enumerated, mixed and compounded in about the proportions specified.

80,719.—VENTILATOR.—John F. Frye, Lowell, Mass.

I claim the combination of a metallic chimney with an adjoining heat conducting tube or box, in which the air is heated by the chimney, and conveyed to rooms above the level of the fire, said tube or box being controlled by valves at both ends, so that it may be used as a ventilator in the warm season.

80,720.—COMPOUND FOR EXTINGUISHING FIRES.—Edward A. Galbraith, Boston, Mass.

I claim, 1st, A solution of salt cake of commerce in water for extinguishing fires.

2d, A solution of chloride of magnesium and silicate of soda, in combination with salt cake of commerce, or its equivalent, for use in extinguishing fires, substantially as set forth.

3d, A solution of any soluble silicate, Epsom salts, and bicarbonate of soda, in combination with salt cake or sal-nixon, or their equivalents, for the purpose set forth.

4th, A solution of chloride of calcium, and soluble silicate, any bicarbonate of soda, in combination with salt cake of commerce, or its equivalent, for use in extinguishing fires.

80,721.—TUCK FOLDER FOR SEWING MACHINES.—Charles H. Gardner, Rochester, N. Y.

I claim, 1st, The piece, B, constructed as described, and consisting of the parts, L u H, spring, a, with open eyelet, e, all constructed as and for the purposes set forth.

2d, In combination with the above, the part, A, consisting of the raised block, c, and adjustable plate, H', all constructed as described, and operating together for the purpose set forth.

80,722.—VISE.—O. H. Gardner, Fulton, N. Y.

I claim, 1st, The combination of the spring, J, with the ball, H, formed upon the lower end of the shank, g', and with the cylindrical slide bar, I, substantially as herein shown and described, and for the purpose set forth.

2d, The combination of the sliding dog, O, with the shank, g', of the front jaw, G, and with the outer end of the cylindrical sliding bar, I, substantially as herein shown and described, and for the purpose set forth.

3d, The combination of the spring catch, P, with the shank, g', and with the sliding dog, O, substantially as herein shown and described, and for the purpose set forth.

4th, The described construction of the flanged plate, D, and the recessed and slotted plate, E, the former being attached to the shank of the jaw, B, by a screw, in order to be removable, as herein shown and described.

80,723.—EXTENSION WARDROBE FRAME.—Elias Gill, New York city.

I claim, 1st, An extension skeleton frame, for portable wardrobes, constructed and operating substantially as described, so that it can be longitudinally and laterally extended and contracted and folded together, as set forth.

2d, The posts, A A, B B, when connected and combined with the grooved C C, and with the extension bars, D D, E E, and with the jointed levers H H, or their respective equivalents, all made and operating substantially as herein shown and described, for the purpose specified.

80,724.—MACHINERY FOR PICKING AND SEPARATING COTTON WASTE.—Darius Goff, Pawtucket, R. I.

I claim, 1st, A cylinder, B, armed with claw hooked teeth, L, so constructed that when set their points shall travel foremost as the cylinder revolves, substantially in a line concentric with the surface of the cylinder, in combination with the feed roller, G, or other suitable feeding mechanism, as described.

2d, The combination of the cylinder, B, as described, with a casing or jacket, m, constructed with a suitable opening, H, and a door for closing the same, substantially as and for the purpose specified.

3d, The combination of the cylinder, B, as described, with the feed roller, G, and retaining bar, R, or other suitable mechanism for delivering and retaining hold of the material, substantially as described, while it is subjected to the action of the cylinder, as specified.

80,725.—MACHINE FOR CUTTING AND FOLDING SHEET METAL.—A. G. Gray (assignor to himself and James T. Magee), St. John, New Brunswick.

I claim, 1st, The rectilinear reciprocating cutter head, E, and knife, B, as arranged with an independent pressure bar, F, of the cross section shown, and a rectilinear reciprocating and rocking lower knife and folder, substantially as described.

2d, The connecting rod, i, having its opening about shaft, M, elongated vertically, as arranged with trunion blocks, h, coupling screw, n, lifting and depression pins, m and o, and cams, p and q, substantially as and for the purpose described.

3d, The pressure bar, F, having notched standards, f, as arranged with cutter head, E, spring, g, and cams, e, as and for the purpose described.

4th, The arrangement of the pressure bar, F, as described, in combination with the rectilinear reciprocating and rocking folder, N, carrying knife, C, substantially as described.

80,726.—MACHINE FOR MAKING WHEELS.—Harrison Haag, Bernville, assignor to himself and George W. Yager, Reading, Pa.

I claim, 1st, A disk, J, adjustable, as described, on a standard, I, and carrying a tool, k, to which a longitudinally and a rotary motion may be imparted for the purpose set forth.

2d, The cross head, G, with its arm, v v, and screw rods, H and z, sliding on the vertical standards, F F', so that when in an elevated position it will serve to retain a hub, and when depressed will hold a felloe, all as and for the purpose specified.

80,727.—WASH BOILER.—Alex. W. Hall, New York city.

I claim the combination of the circulating chamber, C, attached to the shell, B, with the boiler, A, provided with apertures communicating with each, all constructed and arranged substantially as described.

80,728.—FIRE PROOF SAFE.—J. L. Hall, Cincinnati, Ohio.

I claim, 1st, Arranging a series of jars or other anti-corrosive vessels, C, containing water, or other suitable liquid, when the same are embedded in concrete, hydraulic or other cement, between the inner and outer casings, B and A, respectively, of fire proof safes, substantially as and for the purpose specified.

2d, The combination, in the construction of safes, of the case, A, bars, a, and the angle irons, L, when arranged as described.

3d, The perforated lining, B, to permit the escape of the steam to the interior of the safe, substantially as and for the purpose set forth.

80,729.—CLOTHES DRYER.—George H. Hammond, Davenport, N. Y.

I claim a clothes rack, having folding radial arms, b, ropes, f, and jointed braces, d e, in combination with two hubs fixed rigidly on a central staff, A, all substantially as shown and described, and for the purpose set forth.

80,730.—CAR COUPLING.—C. R. Hardy, Lexington, Ind.

I claim the slotted coupling bar, A, pivoted block, B spring, C, and mortised spring bars, D, with each other and with the draft bars of the cars, substantially as herein shown and described, and for the purpose set forth.

80,731.—FIREPLACE.—D. Hattan, Zanesville, Ohio.

I claim, in combination with a fireplace back, providing with a sliding plate C, one or more air tubes, E, arranged in and through the back, beneath the plate, substantially as set forth.

89,732.—PATTERN FOR TRIMMING HAT BRIMS.—C. M. Hawes, New York city.

I claim the revolving plate, C, with upright springs or elastic bars, F, attached, provided with pins, a, at their upper ends to fit in holes in the pattern, G, all arranged substantially in the manner as and for the purpose set forth.

80,733.—MACHINE FOR BLOCKING AND STRETCHING HATS.—George H. Hawkins, New York city.

I claim the combination of a block or former, to form the crown and body from the inside, and a rim or former, to form the brim from the upper side, with a base rim, to aid in holding the material while it is being molded or formed, substantially as described.

80,734.—BELT PUNCH.—Eben Hester, Suffield, Conn.

I claim a belt tool, constructed substantially as and for the purposes described.

80,735.—CAR COUPLING.—Omer Hewes, Kankakee, Ill.

I claim the lever jaws, E, pivoted in the angle between the bumper head, B, and the side bars, C, and attached at their inner ends to the slotted springs, F, in combination with the cam, G, whereby the coupling pin, D, is released from the lever jaws by the action of the cam upon the springs, as herein shown and described.

80,736.—SUPPORT FOR CAR SEAT BACK.—George Higginson, Newark, N. J.

I claim, 1st, The elastic bearings, consisting of the spring, E, and sliding blocks, C C, for car and other seat backs, made and operating substantially as herein shown and described.

2d, The blocks, C C, when combined with the springs, E, and cases, D, and when having pins, c, that fit into the slotted or grooved cases, substantially as herein shown and described.

80,737.—METHOD OF SEPARATING FIBRES FROM MULBERRY TREES.—Wilhelm Holdman, New York city.

I claim the method herein described of producing silk from mulberry trees.

80,738.—VALVE FOR STEAM ENGINE.—Wm. D. Hooker, San Francisco, Cal.

I claim, 1st, The recesses, o o', in the piston, b, arranged with reference to the ports, h h', substantially as herein set forth and shown.

2d, The arrangement, with relation to the cylinder, a, valve chamber, c, and the additional puppet valve chamber of the vales, d d', with its recesses u u', supply port, f, ports, g g', h h', i i', e e', vents, q q', exhaust ports, j j', ports, s s', and puppet valves, r r', substantially as herein described and shown.

80,739.—AMALGAMATOR.—Alfred Horn, Silver City, Nevada.

I claim, 1st, In combination with the annular chambers, B and B', the connecting groove or grooves D D, substantially as and for the purpose specified.

2d, The inclined projection or scrapers, F F, cast at the end of the shoe, conforming to the natural wear of the shoes and dies without adjustment, substantially as described.

3d, Attaching the wings, G G, by the beveled slots, H H, and lugs, H' H', substantially as described.

80,740.—APPARATUS FOR DISTILLING SPIRITS.—Clark S. Hutchinson, Burlington, N. J.

I claim, 1st, The flat upright condenser, O, having arranged within it the shelves, d1 d2, overlapping each other, and shaped as described, with outlets for the escape of spirits of different grades, substantially as shown and described.

2d, The pools, d', either inside or outside of the condenser, C, in combination with the outlet pipes, g g', arranged and operating substantially as described.

3d, The doubler, M, constructed as described, between the still and the condenser, having the two pipes, m1 m2, intermediate valve, p, and inlet pipe R, and operating substantially as shown and described.

4th, The arrangement and combination of the condenser with its shelves d1 d2, the pool, n, with its exit pipes, g g', and doubler, M, connected and operating in conjunction, as described.

80,741.—PASSENGER REGISTER.—Thomas Jacobs (assignor to himself, James E. Kennedy, and John H. Kenneoy), Philadelphia, Pa.

I claim, 1st, The combination of the check lever, W, with the gate, C, arranged and operating substantially as described.

2d, The combination and arrangement of the ratchet, U, and spring pawl, V, with the rod, D, and gate, C, substantially in the manner described and for the purpose specified.

80,742.—SCREW.—P. N. Jacobus, Flat Brookville, N. J.

I claim the screw, A, having its head provided with the triangular notches b, extending entirely through the same, longitudinally of the screw, and adapted to receive the jaws of the screw driver in such a manner that said jaws shall complete the beveled circumference of the head, as herein described, for the purpose specified.

80,743.—BEDSTEAD FASTENER.—John Janeway, Indianapolis, Ind.

I claim the plate, B, consisting of the curved and beveled edges, A, and secured by the wedge, K, fastening the same in the post, when made, constructed, and operated substantially as set forth.

80,744.—SOCKET FOR TOOL HANDLE.—William H. Johnson, Philadelphia, Pa.

I claim a cast screw socket, B, for tool handles, when the screw threads, a, have open spaces, b, between them, formed by means of a sand or composition core, H, substantially as and for the purposes herein set forth.

80,745.—TERRET.—William H. H. Jones and Edward S. Harris, Morrison, Ill.

We claim a terret, in which the spring, D, acts upon the hinged section, C and the latter and the section, B, are fitted into one another at the ends, said parts constructed and arranged in relation to one another, substantially as described.

80,746.—HAND CORN PLANTER.—John F. Kinglesmith, Harden county, Ky.

I claim a rocking cylinder, F, and seed receptacles, S, therein, placed in the bottom of the hopper, E, over a delivery tube in a divided shaft, A A', when combined by means of a crank, G, and pivoted connecting link, with a slotted guide plate, B, secured in the lower section, A, of said shaft, A A', the whole being constructed, arranged, and made to operate substantially in the manner and for the purpose herein set forth.

80,747.—APPARATUS FOR CONCENTRATING ORES AND MINERALS.—S. R. Krom, New York city.

I claim, 1st, An ore bed, composed of tubes or hollow bars, constructed and arranged to admit of the passages within and through or out of them of a current or currents of air or water, in such a manner as that said air or water, in escaping therefrom, will meet in the center cross the ore passages or openings in the bed, substantially as specified.

2d, An ore bed made up of tubes of a reticulated character, having an air an air or water inlet or opening at their end or ends, and made either with without bottoms, d, essentially as and for the purpose or purposes herein set forth.

80,748.—ICE PITCHER.—Thomas Leach, Taunton, Mass., assignor to Reed and Barton.

I claim, 1st, The combination of a detachable and removable glass, earthenware, or chinaware lining, or interior pitcher with the metallic pitcher, A, and a ring, plate, or other equivalent device for holding the pitcher and lining together, and yet permitting the lining to be removed when necessary.

2d, The ring, G, having the rim or flange, g, when used in connection with the walls, A, and the lining, F, in the manner and for the purpose set forth.

3d, The combination of the ring, G, filter, H, and valve, J, forming a neat attachable and removable apparatus for ice pitchers, substantially as set forth.

4th, The combination of the apparatus above referred to with the walls, A and the screw rod, r, substantially as described.

80,749.—WRITING AND DRAWING DESK.—William W. Levering, New York city.

I claim, 1st, The described arrangement of the slate, G, in the part, F, the sliding frame and removable ground glass plate, J, in the hinged portion, D, of the desk, the blackboard, L, on the back of the upper desk, and the drawer, E, having the partition, c, and stop or stops, d, all constructed to operate in the manner and for the purposes substantially as herein set forth and shown.

2d, The within described combination of writing desk, blackboard, drawing slate, and writing slate, as set forth.

80,750.—CURTAIN FIXTURE.—D. E. Long, Pawtucket, R. I.

I claim the plates, C C, with the spurs, a, attached, in combination with the spring, D, all constructed, arranged, and applied in the manner substantially as and for the purpose set forth.

80,751.—STOVE OVEN.—M. W. Long, Bangor, Me.

I claim, 1st, The grate, f, when constructed and operated substantially in the manner specified.

2d, In combination with the grate, f, the disk, a, fitted to revolve in the manner and for the purpose substantially as shown and described.

3d, The device for raising the grate, consisting of pins, k, upon the underside of the grate, and the inclines, i, in the disk, whereby the grate is raised or lowered at will, by revolving it relatively to the disk, substantially as and for the purposes specified.

80,752.—HANGER FOR SHAFTING.—J. W. Loraine, Philadelphia, Pa.

I claim, 1st, The combination, with a hanger, of a plummet, B, and projection, m, the latter being arranged in respect to the center of the bearing and the point of suspension of the plummet, as set forth for the purpose specified.

2d, The within described hanger, composed of the permanent portion, A, with its plummet, B, and projection, m, and the adjustable portion, D, carrying the bearings, E and E', the whole being combined and arranged substantially as and for the purpose described.

3d, The cap, F, arranged to confine the bearing E and E', secured in front to the portion, D, of the hanger by a bolt or screw, and fitting at the rear in a recess in the said portion, D, substantially as and for the purpose herein set forth.

80,753.—FOOT MUFF.—William Marot Marshall, Philadelphia, Pa., assignor to himself and Joseph B. Alexander, Washington, D. C.

I claim, as an article of manufacture, a foot muff, as and for the purposes and in the manner as herein described.

80,754.—GILDING AND SILVERING MICA AND GLASS.—William Marot Marshall, Philadelphia, Pa., assignor to himself and Joseph B. Alexander, Washington, D. C.

I claim the method of gilding and silvering mica and glass, in the manner and for the purposes substantially as described and set forth.

80,755.—THIMBLE.—James E. McBeth, New Orleans, La.

I claim a thimble, whose body is provided with a series of openings, at the lower end of which is a circumferential projecting rim, a, and whose lower part, A, is suitably indented, all as herein shown and described.

80,756.—TOOL FOR MENDING BELTS.—George W. Miller, West Meriden, Conn.

I claim, 1st, The bolt, m, with spring, t, in combination with the punch, e, and awl, d, of a belt-mending implement, or the blades of pocket cutlery, when constructed and operating substantially as herein described, and for the purposes specified.

2d, The punch, e, blade, c, and awl, d, or any two of them, when secured in one handle for pocket use, substantially as herein described and for the purposes specified.

3d, A belt punch, having the sharp edge, f, and cutting point, f', at one end, and the shoulder and heel, o, at the other end, and secured in a handle by means of a pivot, i, substantially as herein described and set forth.

80,757.—HAME FASTENER.—J. D. Miller, Enon, Ohio.

I claim 1st, The lever, D, constructed with the shoulder, F, and a recess behind it, in which to receive the ring, B, when in working position, substantially as described.

2d, The hook, D, with the point returned within the fold of the hook a described, in combination with a link, proportioned so that while naked, it may be passed over the point of the hook, but not where the strap, C, is present, substantially as set forth.

3d, The lever, D, and crooked link, E, constructed so as to operate in the manner and for the purpose described.

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80,758.—ROLLER WAGON SKEIN.—John W. Morrett and Hiram Watts, Shepherdstown, Pa.

We claim the rectangular bar, a, embedded in the axle, h, and curving at, x, in an arc along the axle tree, g, and fastened thereto by the screw, f, the rollers d and e resting their axles in the ends of the trapezodial blocks, b and c, which slide and are adjusted in the trapezodial gutter in the skein, all constructed and operating in the manner and for the purpose herein set forth.

80,759.—SHAFT COUPLING FOR WAGON.—Ichabod H. Mulford, Orange, N. J.

I claim, 1st, The arrangement and combination of the set screw, E, passing through the clip, a, and axle bed, B, with the rubber carrying plate, e, substantially as shown and described.

2d. The rubber supporting plate, e, or its equivalent, in combination with the hook shaped jaws, A, when so applied as to be capable of removal or detachment of the thill or whiffle tree without detachment of screw or nuts, substantially as set forth.

3d, A thill or whiffle tree coupling, so constructed that by the operation of a set screw alone, on an intermediate block, the thills may be secured to the axle or detached therefrom, substantially as shown and described.

80,760.—QUILTING FRAME.—S. H. Nesbit, (assignor to himself and James Nesbit), Monmouth, Ill.

I claim the rollers, E F H, pulleys, z, and cord, U, and pawl, n, in combination with the frame A D G I, constructed and arranged as described, and for the purpose set forth.

80,761.—MACHINE FOR GRINDING CUTTERS OF MOWING MACHINES.—S. W. Palmer and J. F. Palmer, (assignors to E. G. Storke, S. U. Palmer and Clara M. Palmer), Auburn, N. Y.

We claim, 1st, The combination, with the grinding wheel, and the conical adjustable bearings in which it is hung, of the beveled gearing and crank for driving said wheel, under the arrangement and for the operation as set forth.

2d, The construction of the water trough, stuffing box and frame or bearings, in which the grinding mechanism is supported, in one piece, substantially as herein and for the purposes set forth.

3d, The combination, with frame of the machine, of the adjustable rod and treadle, for holding and steadying the same while in use, as herein shown and specified.

4th. The adjustable swivel clamp, for holding the machine in position without the use of legs or other like supports, constructed and operating substantially as herein described.

5th, The cutter bar, supporting table, O P, when constructed and hinged to frame of the machine, in the manner described, so that it may be adjusted both laterally and towards and away from the grinding wheel, as and for the purposes set forth.

6th, In combination with the parts claimed in the preceding clause, the pivored slotted bar, having its swinging end hung in a segmental slot formed in said table, and the cutter clamp, with or without the cutter bar clamp, S, the said parts being arranged and operated substantially as shown and described.

7th, The employment in connection with the mechanism herein described or its equivalent, for holding and adjusting the position of reaper sections and like articles to be ground, of a grinding wheel, the surface or rim of which has a double bevel in form, so that both edges of the section may be ground without materially changing the position of the cutter bar, as herein shown and set forth.

8th, The combination, with the arms, n1, their central supporting pin, the hollow post or socket for receiving said pin, and the adjusting screw for holding the same, of the knife or cutter bar clamp, its supporting plate, and the horizontal rod upon which the same are mounted and slide, the said rod being provided with a radical arm, curved rod and spring, as described, and the whole being arranged to operate in connection with the grinding wheel, as and for the purposes set forth.

80,762.—MODE OF DRESSING MILLSTONES.—Jesse Pannabecker, Eagle Mills, Durlach, Pa.

I claim the millstone dress, with the furrows, a, the land sides or rubbing surfaces, b, having deep holes or cells formed therein, in the manner and for the purpose substantially as described.

80,763.—MACHINE FOR SEPARATING ORES AND OTHER MATERIALS.—Stephen T. Pearce, New York city.

I claim, 1st, A mechanism arranged to separate the particles of pulverized ore or other granular substance, by impelling it, by the joint action of gravity and centrifugal force, over a metallic or other polished surface, which will modify, by the frictional contact with the same, the direction imparted to the particles of such substance, substantially as and for the purpose set forth.

2d, The combination with the rotating cone, A, of the receptacle, D, divided into compartments, substantially as and for the purpose described.

80,764.—MACHINE FOR SEPARATING ORES AND OTHER GRANULAR SUBSTANCES.—Stephen T. Pearce, New York city.

I claim, 1st, The employment of means for impelling ores and other granular substances by centrifugal force, in combination with graduated receptacles for separating them, either in the atmosphere or in vacuo, substantially as and for the purpose described.

2d, The combination of the adjustable tube, A, provided with the laternal tube, E, or their equivalent, with the receptacles, F, substantially as and for the purpose described.

80,765.—HARNESS ROUND KNIFE.—J. H. Quackenbush, (assignor to himself and J. H. Riley, Springfield, Mass.

I claim the blade, A, having the curved slot, e, therein and hung in the slot, i, of the socket, b, by means of the pivot, c, and secured in position in said slot, i, by means of the screw, f, passing through, or partially through the socket, b, and through the curved slot, e, the whole forming a harness knife, and constructed and operating substantially as herein described and for the purposes specified.

80,766.—REFRIGERATING CHAMBER.—Joseph H. Racey, Jr., New York city.

I claim, 1st, The pocket, H, constructed of a series of flutes or corrugations, connected in a tight manner at their upper ends with the chamber, E, and at their lower ends with the trough, I, said trough being provided with a waste pipe, J, and vent pipe, K, so arranged that the water from the melting ice shall accumulate in the trough, and prevent the circulation of air through the refrigerant contained in said pockets, substantially as set forth.

2d, The combination of the vent pipe, K, with the inverting cone vent, a, arranged and operating essentially as shown and described.

80,767.—SOFA AND BED.—John B. Reith, New York city.

I claim the sections, C and D, in combination with section, B, and frame, A, substantially as herein shown and described, and for the purposes set forth.

80,768.—WAGON JACK.—Samuel Rice, Westford, Vt.

I claim the cast iron racks, D D, constructed substantially as described, and inserted in and held by the posts, B B, as set forth.

80,769.—SERIAL CRANK.—Charles F. Ritchell, Chicago, Ill.

I claim, 1st. The combination of a series of obtuse angled or inclined cranks, A A, constructed and arranged as described, and operating simultaneously, for the purpose of performing boring, drilling, or some other useful mechanical operation, substantially as herein set forth and specified.

2d, In combination with the above the stationary plate, C, and the movable plate, D, frames or fixtures, to retain in position and to operate cranks, A A, substantially as and in the manner herein described and specified.

80,770.—LATHE DOG.—J. W. Russell, Springfield, Mass.

I claim the combination of the screw bolt, h, having the annular groove, o, thereon, the threaded clamp, d, the bolt, w shank, a, and the arm, b, all constructed, arranged, and operating substantially as herein described, and for the purposes specified.

80,771.—LITHOGRAPHIC PRINTING PRESS.—Amaziah G. Shackford, Malden, Mass.

I claim, 1st, The arrangement and combination of the thimble or counterbearing, U, and arm, S, with the cog wheels, J L, and racks, H M and S, substantially as and for the purpose described.

2d, The swinging tooth, 4, pin, 7, spring, 6, cog wheels, Q, flange wheels, R, shaft, P, lever, 31, shaft, 32, crank, 33, arranged and operating in combination with the cams, e' d', substantially as and for the purpose described.

3d, The truncated flange wheels, R R, in combination with the carriage, N, substantially as and for the purpose described.

4th, Operating the tympan and nippers from the shaft, P, by means of cam, 18, and rod, U, and gears, W X Y Z, substantially as described.

5th, The endless cloth, X", combined and arranged with water trough, r, and damping roll, z, and the squeezing rolls, w w", substantially in the manner and for the purpose described.

80,772.—HORSE RAKE.—T. H. Shreeves, Greenbush, Ill.

I claim, 1st, The pawl, X, in combination with the device, d e F G H and S, substantially as described, and for the purpose set forth.

2d, The hooks, v v, substantially as described, and in combination with the main frame, as set forth.

80,773.—WELL BORING APPARATUS.—W. Skiff, Camanche, Iowa.

I claim, 1st, The arrangement of the drums, m and b, with the arms, B B, ponts, L L, and inclines, v v, for purposes set forth.

2d, The arrangement of the augur with the adjustable lips, N N, with shaft, R, all constructed as set forth.

3d, The combination and arrangement of the drill, y, rope, x, lever, w, lever, f, and inclines on drum, b, for the purpose herein described.

80,774.—MACHINE FOR MAKING HARNESS FOR LOOM.—Joseph Sladdin (assignor to himself and John Lord), Lawrence, Mass.

I claim, 1st, The combination, with the twister, d, of the means, substantially as described, for operating the same, as and for the purpose specified.

2d, The combination of the spoon "hookers," g g, with the nooker fingers, c c, and the needles, i i, substantially as and for the purpose described.

3d, The combination of the lapper cylinders, having guide eyes, as described, with the spoon shaped hook, g g, and needles, i i, substantially as and for the purpose described.

4th, The combination with the needle guide and support, j j, of the presser wheels, 15 15, when arranged and operating as and for the purpose specified.

5th, The combination, with the devices for forming the loops, substantially as described, of the devices for knitting the heddles on to the rig bands, substantially as and for the purpose described.

6th, The combination, with the knitting devices herein described, of the lifting guide bars, k k, as and for the purpose described.

80,775.—CONVEYING LIVE FISH.—Anton Julius Smidth, Copenhagan, Denmark.

I claim pumping or otherwise forcing and mixing air with sea water, contained in tanks, in which salt water fish are placed, for the purpose of keeping such fish alive, substantially as above described.

80,776.—STOP BOXES FOR COCKS OR VALVES OF WATER AND GAS PIPES.—James Smith, St. Louis, Mo.

I claim, 1st, An extensible stop box, constructed of the two parts, A and B, and so arranged as to permit adjustment by means of screw treads or rings, substantially as herein described.

2d, In combination with the above, the caps, a, and C, when constructed and applied as and for the purpose described.

80,777.—PULLEY.—James P. Smith (assignor to himself and Francis W. Glenn), Oshawa, Canada.

I claim, 1st, A metal pulley, provided with grooves or recesses in its periphery, for the purpose set forth.

2d, A grooved or recessed metal pulley, in combination with the strips or pieces, b, and the facing, C, substantially as described.

80,778.—HORSE SHOE.—Lemuel A. Smith Pekin, Ill.

I claim the braces, E E, constructed and regulated as described, for the purpose of moving the clips, D D, in or out, as may be desired, substantially as herein set forth.

80,779.—TANNING.—Simon Snyder, Cincinnati, Ohio.

I claim the method of tanning substantially as hereinbefore described.

80,780.—PEN AND PENCIL CASE.—L. F. Standish, Springfield, Mass.

I claim the combination of the slotted handle, A, with the slide, B, having the knife blade, H, at one end, and a pen or other convenient tool at the other and operated by the pin, D, working in the slot, E, substantially as shown.

80,781.—TATTING SHUTTLE.—Ira H. Stockwell and Lizzie C. Goodwin, Worcester, Mass.

We claim, as a new article of manufacture, a tatting shuttle, having one of the ends of one of its sides sharpened to or provided with a, point, substantially as and for the purpose specified.

80,782.—STAND FOR MUSKETO NETS.—Albert Strasser and B. M. Lewy, Montgomery, Ala.

We claim, 1st, the stand, A, provided with the slide, C, braces, K, link, E, and extension, F, constructed and arranged as and for the purpose described.

2d, The combination with the same of the skeleton frame, I, or other equivalent means for supporting a musketo net, substantially as and for the purpose described.

80,783.—FLY FRAME FLIER.—James S. Streeter, Providence, R. I., assignor to himself and City Machine Company.

I claim constructing fly frame fliers of malleable or annealed cast iron, with one or both legs cast with a groove upon a core or its equivalent, and with an ear, the flanges of said legs and the ear being rolled down, to form the groved tube, a, as herein shown and described.

80,784.—WASHING AND WRINGING MACHINE.—Robert K. Tomlinson, Brownsburg, Pa.

I claim, 1st, Imparting an alternate reciprocating motion to a series of upper and lower rollers A A', by means of the cams, D, and a rotary motion to each roller by the double series of cords, i, when the cords of the upper series are driven from the upper wringer roll and the cords of the lower series from the lower wringer roll, as hereindescribed, for the purpose specified.

2d, The cam wheels, D D, in combination with the rubbing surfaces, A A, by which the reciprocal motion to these surfaces is imparted.

3d. The combination of the upper and lower series of rollers, A A', cams, D, levers, P, bar, R, double series of cords, i, and wringing rolls, J, arranged and operating as described, for the purpose specified.

80,785.—UMBRELLA.—William F. Turner, Philladelphia, Pa.

I claim, 1st, The notches in the permanetly attached thimble, D, or the ferrule end of the cane, wherein to hook or attach the ends of the ribs, as herein described and represented.

2d, The notched runner, figs. 5 and 11, provided with the spring, L, having a detaining pin, the slide, M, and the encircling ring, O, and adapted to occupy the detachable bead of the walking stick, as herein described and represented.

80,786.—LOOM FOR WEAVING FRINGE.—Louis D. Valetton, Philadelphia, Pa., assignor to Hensel, Reichert, Wolff & Co.

I claim, 1st, The slotted shuttle, G, constructed with a hook, g', and applied to operate in the manner and for the purpose specified.

2d, The twisting book, H, having an intermittent rotary and vertical and horizonal motions, and arranged to operate in conjunction with the shuttle, G, substantially as and for the purpose set forth.

3d, The spools, N, and N1, attached to the bar, N2, having a vertical movement within the frame, and being connected with the lever, N7, through the medium of the rods, n n1 n2, and levers, N3, and N4, all as herein described and for the purpose set forth.

4th, The pin, 18, applied and operating substantially as and for the purpose forth.

80,787.—COCK FOR RACKING OFF BEER.—Friederich Wagner, Danville, Pa.

I claim, for the purpose specified, the arrangement in a T-shaped tube of a cock, B, in the main part of the tube, so constructed as to be capable of shutting off the whole flow, and a deflecting cock, C, at the junction of the cross tube with the main tube, so constructed that by turning it at different angles the fluid coming from the main tube can be deflected totally or partially into either arm of the cross tube without the possibility of arresting in any degree the flow of the liquid through the main tube, the several parts of the apparatus being constructed and operating in the manner herein set forth.

80,788.—ADJUSTABLE OX-YOKE.—Sylvester G. Walker, Croydon, N.H., assignor to himself, William C. Allen, and Abijah Powers.

I claim, 1st, The method of hanging the neck pieces, B B', to the beam, A, by means of the bolts a a" a"", the guide blocks, D D', the slots' M M', and the cap pieces, C C', as above described.

2d, The advantage ring, E, in combination with the levers, G G', constructed and operating as above described.

3d, The method of making the neck pieces, B B', stationary at any given points, equidistant or not equidistant from the centre block, F, within the limits of the reciprocating motions of the said neck pieces, by removing the blocks, K K', from the slots, M M', and screwing down tightly the cap pieces, C C', upon the beam, A, as above described.

80,789.—SEWING MACHINE.—D. Weaver, Guilderland, N. Y.

I claim, the spring, f, and fappet arm, g, in combination with the latch, e, and hook needle, n, substantially as and for the purpose set forth.

2d, The stop, h, in combination with the spring, f, latch, e, and hook needle, n, which is secured in a bar attached to the wrist pin, a, substantially as and for the purpose described.

3d, The spring, q, and bracket, m, sliding on the shank of the fork feeder, and compressing the spring as the needle rises, in combination with said fork feeder and needle, constructed and operating substantially as and for the purpose set forth.

4th, The slide, u, and hinged bracket, I, in combination with the needle bar, G, feed fork, k, and lever, K, or its equivalent, substantially as and for the purpose described.

80,790.—STRAINER.—William Westlake, Chicago, Ill.

I claim the removable strainer, A, when constructed and attached substantially as specified.

80,791.—RIVET.—Elonzo S. Wheeler, Westport, Conn.

I claim a rivet consisting of a tube, A, with its head, B, formed or attached thereon, substantially as described, with its corresponding head, C, constructed so as to be attached thereto, as herein set forth, as a new article of manufacture.

80,792.—NUT-SQUARING CHUCK.—Henry F. Wheeler, Boston, Mass

I claim a chuck, for the purpose described, as made with the screw-threaded end, c, provided with a movable shoulder, d, arranged to operate substantially as set forth.

80,793.—CURTAIN FIXTURE.—William H. Woods, Philadelphia, Pa.

I claim the combination and arrangement of barrel, B, with coiled spriug, S, plate D, and shaft, T, for the purpose herein set forth.

80,794.—MOP AND CLOTHES WRINGER.—Elijah Youngs, Tuscarora, N. Y.

I claim, 1st, The ear, B, provided with the slot, E, curved as described and for the purpose set forth.

2d, The combination of the ears, B B, provided with slot, F F, curved as described, with the rollers, C C', and the lever, E, substantially as and for the purpose set forth.

3d, The socket plate, G, provided with a cam button, B, or its equivalent, in combination with the ear, B, substantially as and for the purpose set forth.

80,795.—AGRICULTURAL MACHINE.—Henry Cowing, New Orleans, La.

I claim, 1st, The application and combination of the double-block system of equalizing draft, as above set forth.

2d, The application and combination of the single-block system, in combination with the double-block system.

3d, The quadruple whiffletree.

4th, The application and combination of the cross bar, H2, with the tongue, for the purposes specified.

5th, The slotted slide bar, O, for the whiffletrees to slide upon, as set forth.

6th, The joint in the tongue, as and for the purposes set forth.

7th, The rotary grooved cylinder, as and for the purposes specified.

8th, The adjustable thumb screw, l, in combination with a slide valve for regulating the quantity of grain grown.

9th, The application of a steering apparatus to agricultural machines, composed of the wheels, I, cross bar, K, sheaves, i i', standards, I', rope or chain, J, stirrups, j j, cross bar, l, and the levers, L and L'.

10th, The standards, t', and the adjustable cross beam, K.

11th, The standards, D1 D2, of the canopy, the cross bars provided with screws, d d, for the purposes set forth.

12th, The curved standards, e3, and box straps, e4, for the purposes specified.

13th, The semi-circular rack lever, E, and handle and stop lever spring, f, for the purposes herein set forth.

14th, The tripping lever, p, and cord or chain, p', for the purpose herein set forth.

15th, The application of horse or other power that may be employed to draw the machine, for raising the plows and instrument out of and from the ground, as set forth.

16th, The application and combination of a scraper and presser to a gang of plows, for the purposes herein set forth.

17th, The cross bars, A3 A4, for the purpose herein specified.

18th, The construction of an axle, so that the wheels can be moved further apart or nearer together to suit the widths of rows, as above specified.

19th, In combination with a gang of plows, the digging wheel, K.

20th, The digging wheel, in combination with the arrangement for raising and lowering it, as set forth.

21st, The three-toothed harrow, G, or its equivalent, as and for the purpose set forth.

22d, Making the stares and coulter in one piece, as and for the purposes above specified.

23d, The application and combination of a canopy to a gang of plows or harvesting machines, for the purposes above specified.

24th, The manner of making canopies with an expansive cord, as and for the purpose above specified.

25th, The tube on which the main wheels revolve, for the purposes herein specified.

26th, The curved plow standards and the springs, for the purpose above specified.

27th, The construction of a plow, so that in raking a root or stone, it will be thrown out and forced immediately back, as above specified.

28th, The nest of cups in the cylinder for the purpose herein set forth.

29th, The combination, as seen in Figs. 1 and 2, for the purpose of planting or sowing, as above specified.

30th, The application and combination of the cross bar, H', with the tongue H, Fig 3, for the purposes herein set forth.

31st, The combination, as seen in Figs. 4 and 5, and the particular shape of the third plow with the incline for raising up the soil before turning over, as above set forth.

32d, The mole plow, in combination with the beams, seen in Fig. 15, wheel-raising apparatus, quadruple trees and their arrangement, for the purposes herein specified.

33d, The opening of the mould at different depths, and taking off the front molds and using their standards only, and using them all at once or separately, as above set forth.

34th, The application and combination, as seen in Fig. 8, with its modifications, for the purposes herein set forth.

35th, The application and combination, as seen in Figs. 10 and 11, of the gangs of plows, and the tines in the center, or before and behind the plows, as above set forth.

36th, The stubble lowerer, Q, and the arrangement herein set forth, for opening a deep furrow and turning the stubble into it, and the arrangement and combination of the plows, as seen in Fig. 12, or their equivalent, as set forth.

37th, The arrangement and combination, as seen in Fig. 13, for covering the caves as set forth.

38th, The single hinged arm, for the purpose herein set forth.

39th, The arrangement for ditching, as set forth, and under draining by the mold plow, as set forth.

REISSUES.

75,035.—FRUIT GATHERER.—Dated March 3, 1868; reissue 3,060.—Virgil H. Lyon, Plainfield, Ind.

I claim, 1st, The head, A A', furnished with the fingers, C and B, when formed, constructed, and arranged substantially as herein shown and described.

2d, The head, A A', in combination with the sack or hose, S, substantially as herein specified.

3d, The sectional handle, D, constructed as described, in combination with the head, A A', substantially as and for the purpose set forth.

58,363.—CARD RACK.—Dated October 2, 1866; reissue 3,061. James Adair, Pittsburg, Pa.

I claim, 1st, A wire spring, of spiral or other continuous curve, when so made as to be fastened by hooks, eyes, or other similar device, either with or without an intermediate bed plate, to a desk, table, pedestal, or other like object, for use as a spring rack, substantially as hereinbefore set forth.

2d, A bed piece so made with raised sides and ends, as that a spring of continuous curve placed in the space enclosed therein, and properly fastened, shall be secured against both lateral and undue longitudinal motion, substantially as and for the purposes hereinbefore set forth.

3d, Fastening a spring or springs of continuous curve to a bed piece by a fastening rod passing longitudinally through or along the spring or springs, and properly secured at each end, substantially as and for the purposes hereinbefore set forth,

4th, A spiral or other continuously curved spring or springs, a, in combination with a metallic bed piece, A, by which to fasten the spring to a table or pedestal or other like object substantially in the manner hereinbefore expressed.

24,179.—HOSE COUPLING.—Dated May 24, 1859; reissue 3,032. —Amos Broadnax, Montclair, N. J., and Rollin B. Gray, Brooklyn, N. Y., assignees, by mesne assignments, of N. N. McLeod, St. Louis, Mo.

We claim joining the end or ends of a pipe or tube by means of a tubular coupling, one end or each end thereof made conical or beveled, and having a tubular screw nut and thread, said connection being susceptible of receiving or having cast upon it a branch or branches, without interfering with the construction of the joint or joints, all substantially as shown and described.

24,451.—METALLIC EARS FOR ATTACHING HANDLES TO PAILS AND LIKE VESSELS.—Dated June 21, 1859; reissue 3,063.—Thomas Evans, Newark, N.J.

I claim, 1st, Metallic ears, for attaching the handles to pails and other vessels, formed with concentric annular corrugations surrounding the bail orifice, substantially as and for the purposes set forth.

2d, So arranging the hooked ends of the bail as to give them an additional bearing against one or more of said corrugations, substantially as set forth.

3d, The drip-opening or passage, formed by the downward continuation of the outer corrugations, for draining the interior cavity, as shown and described.

4th, A bail ear, formed with the portion surrounding the eye, raised to receive the hooked end of the bail, when the marginal portion or portions thereof are formed on the plane of the part to which they are to be attached, substantially as set forth.

28 033.—BELT-FASTENING.—Dated April 24, 1860; reissue 3,064.—John Ashton Greene, and Henry A. Tweed, New York city, assignees, by mesne assignments, of G. W. Blake.

We claim, 1st, the employment, in connection with belts or bands, of a series of links or looped shanks, constructed to receive, at either end, a rod or locking bar, substantially as herein described.

2d, The manufacture of belt studs, constructed with eyes or loops, so that a series of them may be locked or fastened at either end by a single rod or cross bar, substantially as described.

3d, The combination of double-eyed shanks, with corresponding locking-bars, substantially as and for the purpose herein set forth.

4th, The method herein described, of fastening the ends of two metallic bars united together by shanks passing through the ends of the belt or band to be united, substantially as set forth.

31,859.—BELT FASTENING.—Dated March 26, 1861; reissue, 3,065.—John Ashton Greene and Henry A. Tweed, New York city, assignees, by mesne assignments, of G. W. Blake.

We claim, 1st, As an article of manufacture, double-headed studs, shaped substantially as described, with a view to the uses herein set forth.

2d, The method of fastening or uniting the ends of belts by a series of double headed studs, substantially as herein shown and set forth.

3d, The use, in combination with the ends of belts or bands, of double headed studs, substantially as and for the purpose herein described.

70,151.—PRINTERS' GALLEY.—Dated December 4, 1868; reissue 3,066.—R. Hoe & Co. (assignees of Alexander T. De Puy), New York city.

We claim the combination, with the wooden frame of a printers' galley, of a metallic lining, secured thereto by means of a groove or grooves, substantially as and for the purpose specified.

67,196.—CHECK BRACE FOR CARRIAGE.—Dated April 28, 1862; reissue 3,067.—Isaac D. Johnson, M. D., Kennett Square, Pa.

I claim, 1st, The brackets, F F', located upon the perch, substantially as and for the purpose described.

2d, The brackets, H H', secured to the elliptic springs, C C', substantially as and for the purpose described.

3d, The combination of the brackets, F F', and the brackets, H H', with the connecting plate springs, G G', when arranged and operating substantially as and for the purpose described.

4th, The combination of the brackets, F, on the perch, the brackets, H H, on the springs, the plate springs, G, and the elliptic springs, whereby the torsion of the springs and the undue oscillation of the body are prevented.

5th, The combination, with the body of the vehicle, of the shackle, e, the spring, C, the brackets, F H, and the plate spring, G, whereby the spring is braced from the center, substantially as described.

6th, The combination, with the body of the vehicle, of the shackles springs brackets, and connecting plate springs, substantially as and for the purpose set forth.

37,867.—LAMP.—Dated March 10, 1863; reissue, 3,068.—Carl A. Kleeman, Erfurt, Prussia.

I claim, 1st, An argand burner and chimney holder, in combination with the cone, q, provided with openings, 4, to admit air to pass in between the cone and the glass chimney, substantially as set forth.

2d, The cone, q, provided with air openings, 4, in combination with the cylinder, p, and arms, 5, for connecting the said cone to the argand burner, substantially as set forth.

3d, The cup, 3, in combination with the cylinder, p, and wick tube, o, as and for the purposes set forth.

27,319.—MACHINE FOR BENDING SHEET METAL.—Dated February 28, 1860; reissue 3,069.—Orson W. Stow, Plantsville, Conn.

I claim, 1st, Making the folding bar, commonly used in such machines, in two parts, f and i, one part, i, being adjustable in respect to the folding plate e, by means of set screws, n, or other equivalent means, so far as to form a close or open lock, for joining two pieces of metal plate, or closing around a wire, substantially in the manner as described.

2d, Arranging the griping jaw, s, with the folding bar, f and i, in such a manner that on motion being given to the folding bar, f, on its axis, g, the griping jaw, s, is made to close on the folding plate, e, and at the same time carry along with it the folding bar, i, into such a position as will bring its axis, g, of motion nearly in to a line with the edge of the folding plate, e, thereby placing the folding plate, f and i, in position to be turned over to the folding plate, e, necessarily, and simultaneously with the motion of the folding bar, f and i, on its axis, g, substantially in the manner as described.

3d, The bed plate proper, a a', to which is secured the folding plate, c, in combination with the hinged frame, b, having journal boxes, d, and griping jaws, s, the folding bar, f and i, having journals, g, and cams, o, arranged and operating together, substantially in the manner as and for the purpose described.

4th, In a machine which uses but one folding bar, as described the combination of the folding plate with the folding bar, when so constructed and operating together that the distance between their adjacent edges can be increased or diminished at pleasure, for the purpose of forming both open and close locks or bends in sheet metal.

26,329.—BOOT AND SHOE TIP.—Dated November 29, 1859; reissue 1,339, dated September 2, 1862; reissue 3,070.—The American Shoe Tip Company, Conn., assignees, by mesne assignments, of Newman Silverthorn.

I claim a formed tip, substantially as described, as an article of manufacture.

19,321.—PLOW.—Dated February 9, 1858; improvement added August 2, 1859; reissue 3,071.—George Watt, Richmond, Va.

I claim, 1st, The combination, in a plow, of a land side, having an inward inclination from its base toward the mold board, and a neck breast, or standard, having a diverse or outward inclination, substantially as set forth.

2d, Constructing mold board and land side of cylindrical surfaces, intersecting along the cutting edge of the plow, in combination with the curved standard, S, the whole being constructed substantially as and for the purposes hereinbefore set forth.

3d, The combination of the eccentric roller, r, beam, B, notches, i, and cuff f, substantially as set forth.

DESIGNS.

3,143.—CARPET PATTERN.—James Allinson, Philadelphia, Pa.

3,144 to 3,147.—CARPET PATTERN.—Benj. Crabtree, Jr., Philadelphia, Pa.

3,148 and 3,149.—KNIFE OR FORK HANDLE.—Jos. Hill, Newark, N. J.

3,150.—SCARF RING.—Ralph S. Jennings, New York city.

3,151.—BUST OF FREDERICK DOUGLAS.—Dayton Morgan, Chillicothe, Ohio.

3,152.—GOBLET.—J. S. Palmer, Portland, Me.

3,153.—COOK'S STOVE.—Jacob Steffe, Philadelphia, assignor to Francis Buckwalter & Co., Royer's Ford, Pa.

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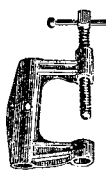

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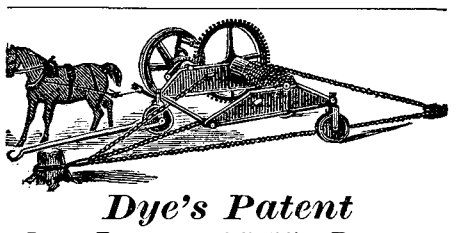

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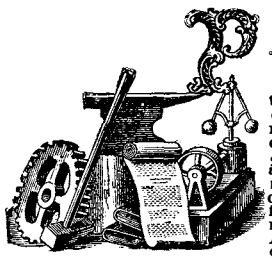

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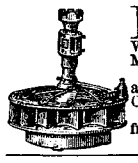

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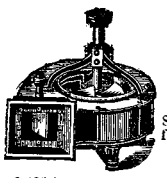

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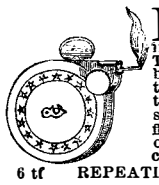

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